

## AGRICULTURAL PUBLICATIONS.

The following publications have been issued by the Department, and are available for distribution at prices mentioned:—

"Fruit Tree and Grape Vine Pruning," by Geo. Quinn (Horticultural Instructor); price, 2s. 6d.; posted, 2s. 8d.

"Vinegrowers' Manual," by A. Sutherland; price, 6d.; posted, 7d.

Journal of the Department of Agriculture, 1s. per annum in advance; 3d. per single copy to residents of South Australia. Other places, 2s. 6d. per annum.

Any of the following bulletins and leaflets may be obtained by sending a penny stamp for postage:—

| Subject.  | Bulletin No. | Subject.   | Bulletin No. |
|---|--------------|--|--------------|
| <b>STOCK AND DAIRYING.—</b>   |              | <b>AGRICULTURE, &amp;c.—</b>   |              |
| Bloodworms .....  | I.           | Agricultural Seeds, Depth of Sowing .....  | 71           |
| Castration of Colts .....   | XXIX.        | Dry Farming Conference, 1911, Report .....   | XIII.        |
| Cocky Chaff and Straw as Feed for Stock .....   | III.         | Ensilage, Conservation of Green Fodder as .....  | XIV.         |
| Cow, Some Common Troubles of .....  | XXXV.        | Forage Crops in S.E. .....   | 92           |
| Dairy Cattle, Suggested Rations for Diseases of Farm Animals .....                              | 75           | Inman Valley: Address by Director of Agriculture .....   | 95           |
| Farm Flock, The .....   | 106          | Lucerne Leaf Spot Disease .....  | XV.          |
| Farm Horses, Suggested Rations for Farm Livestock: How to Lay Foundation for Good Strains ..... | VI.          | Phosphatic Manures .....   | 87           |
| Farm Livestock: Equivalent of Foodstuff and Feeding Rations .....                               | VII.         | Possibility of Improvement in the Farming Practices of Hundreds of Ayers and Hanson .....      | 95           |
| Horses, The .....   | 94           | Roseworthy College Harvest—  |              |
| Local Pig Industry, The .....   | 106          | 1910 .....   | 63           |
| Medicine Shelf .....  | 85           | 1911-12 .....  | 69           |
| Roseworthy Agricultural College Flock in 1907-8 .....   | 41           | 1912-13 .....  | 78           |
| Sheep Tick and Sheep Louse .....  | 84           | 1913-14 .....  | 83           |
| Spaying of Cows .....   | IV.          | 1914-15 .....  | 90           |
|   |              | 1915-16 .....  | 104          |
|   |              | 1916-17 .....  | 114          |
| <b>POULTRY.—</b>  |              | Roseworthy Agricultural College Permanent Experimental Field—                                  |              |
| Chickens, Ducklings, &c.: Feeding and Rearing .....   | IX.          | 1905-14 .....  | 89           |
| Great Importance of Drinking Water for Laying Hens .....  | 113          | 1909-10-11 .....   | 65           |
| Incubation .....  | X.           | 1904-15 .....  | 112          |
| Poultry Tick .....  | 74           | Wheat Hay—Investigations into handling, digestibility .....                                    | 82           |
| Storing and Packing Eggs .....  | XXVII.       | Rotation of Crops .....  | 100          |
|   |              | Salts Injurious to Vegetation .....  | 103          |
| <b>HORTICULTURE, &amp;c.—</b>   |              | Seeds Imported from Abroad into South Australia .....  | 105          |
| Codlin Moth, The .....  | 67           | Wheat Diseases and their Treatment .....   | 110          |
| Currant Industry .....  | 68           | Wheat Yields Past and Future, with a reference to the principal factors that govern them ..... | 108          |
| Evaporation of Apples .....   | 101          | Wheat Hay, Stage to Cut .....  | 73           |
| Flowering Periods of Stone Fruits .....   | 88           |  |              |
| Fruit Drying: For Beginners .....   | 31           | <b>MISCELLANEOUS.—</b>   |              |
| Fruit Flies .....   | 24           | Amount of Spirit that may be Extracted from a Ton of Raisins .....                             | 60           |
| "Maggot Fly Pest" .....   | 25           | Beekkeeping Notes—Foul Brood, &c. ....   | XIII.        |
| Orange in South Australia, The .....  | 107          |  |              |
| Peach Curl Leaf Fungus .....  | 64           |  |              |
| Select List of Fruit Trees .....  | 91           |  |              |

THE AGRICULTURAL BUREAU.—Particulars of this Organisation, of which every farmer should be a member, can be had on application to the Department.

# THE JOURNAL

OF THE

## Department of Agriculture

### OF SOUTH AUSTRALIA.

No. 9.

APRIL, 1918.

VOL. XXI.

*Published Monthly by the Department of Agriculture.*

Edited by H. J. FINNIS.

| CONTENTS.  | PAGE.   |
|--|---------|
| POINTS FOR PRODUCERS .. .. .   | 676-680 |
| INQUIRY DEPARTMENT:.. .. .   | 681-685 |
| ROSEWORTHY AGRICULTURAL COLLEGE—HARVEST REPORT, 1917-1918 ( <i>continued</i> ) .. .. . | 686-691 |
| SOME SHEEP WORMS .. .. .   | 692-697 |
| TABLE GRAPES .. .. .   | 697-701 |
| POULTRY NOTES FOR APRIL .. .. .  | 702-704 |
| AGRICULTURAL BUREAU CONFERENCES .. .. .  | 705-717 |
| ADVISORY BOARD OF AGRICULTURE.. .. .   | 718-719 |
| DAIRY AND FARM PRODUCE MARKETS .. .. .   | 720     |
| THE AGRICULTURAL OUTLOOK .. .. .   | 721     |
| RAINFALL .. .. .   | 722 723 |
| AGRICULTURAL BUREAU REPORTS .. .. .  | 724-748 |

All communications to be addressed:

"The Editor, Journal of Agriculture, Victoria Square, Adelaide."

**Notice re Copyright.**—The Copyright in all articles in this Journal is vested in the Crown, and any person reproducing or republishing the said articles without permission from the Hon. Minister of Agriculture will be liable to be proceeded against.

R. P. BLUNDELL,

*Minister of Agriculture.*

## POINTS FOR PRODUCERS.

### Agricultural Bureau Conferences.

The first two Conferences of the Agricultural Bureau for the year took place during March, and it is safe to say that they rank among the most successful gatherings that have been held. The representatives of Mid-Northern Branches met at Wirrabara, and Central Eyre's Peninsula Branches met at Yeelanna. At both places the attendance was large, and proceedings were characterised by keen interest and intelligent appreciation of the importance of the primary industries. At Yeelanna the dominant note was the necessity for a more general adoption of mixed farming, in the place of the prevailing practice of wheat growing as a sole source of revenue. Many speakers emphasized this view, and were able to quote their experience in support.

### River Murray Conference.

The committee responsible for the arrangement of the Conference of River Murray Branches of the Agricultural Bureau have decided to alter the date of the gathering to Tuesday and Wednesday, May 21st and 22nd. As previously intimated, the gathering will take place at Berri, and the local Branch is sparing no effort to ensure a profitable and pleasurable time to the visiting delegates.

### Sugar Beet and Irrigation.

The effect of irrigation on sugar beet was made the subject of a number of tests carried out by F. S. Harris, and recorded in the Utah Station Bulletin, No. 156. The experiments showed the effect of different weekly irrigations and of standard 5in. irrigations applied at certain periods in the growth of the plant on the yield of roots, yield of sugar, percentage of sugar and purity, and size and shape of beets. The life of the sugar-beet plant was divided into the following stages:—(1) Just before thinning, (2) four weeks after thinning, (3) when the beets averaged 2in. in diameter, and (4) when the beets were nearly ripe. The weekly irrigations consisted of applications of 1in., 2.5in., 5in., and 7.5in. of water, made during the regular irrigation season. Tabulated data are presented for the five-year period of 1912-1916, inclusive, and the results compared graphically.

The highest average yield of beets on plats receiving weekly irrigations was secured from 1in. applications, and amounted to 21.92 tons per acre, as compared with a yield of 12.98 tons without irrigation. When but one irrigation was given, that applied at the third stage of growth gave the highest average yield, 18.92 tons per acre. Where more than one application was made, the highest average yield, 23.39 tons per acre, was secured from irrigations made at the first, third, and fourth stages of growth. Irrigation after planting but before the plants were up gave a yield of only 11.22 tons per acre. After the plants were up the least desirable time for irrigation was during the

fourth stage of growth, when an average yield of but 15.09 tons was secured. Proportionately more tops were produced by the high and late irrigations than by opposite conditions.

Except where the water was applied quite late, the percentage of sugar and purity was higher in the irrigated beets than in the non-irrigated. The highest average percentage of sugar was secured from a weekly application of 2.5in. of water, and amounted to 16.32 per cent. When one irrigation was given, the highest average percentage, 15.73 per cent., was obtained from an application made in the third stage of growth, while an average of 14.5 per cent. was obtained from plats receiving no irrigation. The highest average purity was secured from weekly applications of 5in. of water, and amounted to 83.9 per cent., as compared with 78.4 per cent. from non-irrigated plats, and 83.2 per cent. with 2.5in. of water weekly.

The length of beets was not increased by delaying the time of application of the first irrigation, early irrigation apparently facilitating penetration of the roots into the soil. The average length of root from the non-irrigated plats was 10.6in., while the longest roots were secured from the plats receiving applications of water during the first three stages of growth, and averaged 11.7in. Weekly applications of 1in. of water gave roots with an average length of 11.5in.

Irrigation affected the size of the beets in about the same manner that it affected total yield. The highest average weight, 2lbs., was secured from plats receiving 1in. of water weekly, as compared with an average weight of 1.09lbs. from the non-irrigated plats. The percentage of forked beets bore no apparent relation to the amount of water used.

The author concludes that sugar beets do not require large quantities of irrigation water, provided it is properly applied, but that they are sensitive to the time of application.

#### Bokhara Clover and King Island Melilot.

"Hitherto neither Bokhara clover nor King Island melilot have proved of much value in South Australia," states the Director of Agriculture (Professor Arthur J. Perkins), in reply to a correspondent. "It is quite true, of course, that both of these leguminous plants are very hardy; neither of them, however, is particularly good for forage plants. King Island melilot was advertised very largely a few years back, but in my experience livestock do not take to it at all readily. It is very highly scented, and when present in large percentage, it is apt to render ordinary hay unpalatable to livestock. Bokhara clover is in many ways superior to the melilot, but I question whether there is any great advantage in propagating it to any great extent under South Australian conditions."

#### Sand Poisonous to Plants.

A sample of sand, stated to have the power of destroying vegetable life, was recently received from the Mount Barker Branch of the Agricultural Bureau. An analysis of the sample has been made by the

Director of Chemistry, who states that the sand contains 22.7 per cent. of water soluble salts, which have the following approximate composition:—

|                              |                |
|------------------------------|----------------|
| Calcium sulphate . . . . .   | 2.38 per cent. |
| Magnesium sulphate . . . . . | 0.81 “         |
| Magnesium chloride . . . . . | 1.40 “         |
| Sodium chloride . . . . .    | 17.10 “        |
| Undetermined . . . . .       | 1.01 “         |
| Total salts . . . . .        | 22.70 “        |

The sample has a strongly acid reaction. The acidity is equivalent to 0.07 per cent. of hydrochloric acid (HCl). The sample contained no arsenic. The quantity of salt contained in this material, together with its acid nature, probably explains the cause of its being poisonous to plants.

#### Gathering Lucerne Seed.

Where much lucerne is to be harvested for seed, the third cut is left until the greater portion of the seed is hard. It is then cut with the binder or mower, stooked or cocked until thoroughly dried, and then stacked until ready to thresh with power thresher. Where no thresher is available, and where the quantity is not very large, a practical way of handling the crop, says the Superintendent of Experiments (Mr. W. J. Spafford), is to cut it with the binder, stook until dry, chaff it with ordinary chaffcutter, thrash it with stripper (propped up and driven by an engine), and winnow with the ordinary grain winnower, adapting the sieves to suit the small seeds. When a header is available, this will do the threshing, and so do away with the need of chaffing before threshing.

#### Imports and Exports of Fruits, Plants, Etc.

During the month of February, 1918, 1,671bush. of fresh fruits, 3,724bush. of bananas, 10,290 bags of potatoes, 57 packages of plants, seeds, &c., 771 empty wine casks were examined and admitted at Adelaide and Port Adelaide, under the Vine, Fruit, and Vegetable Protection Acts, 1885 and 1910, 122bush. of bananas and 21bush. of pine-apples (overripe) and 26 bags of potatoes (affected by potato moth) were destroyed; 1 case of mixed fruit was also destroyed on account of the presence of codlin moth. Under the Federal Commerce Act, 997 packages of field peas, 237bush. of fresh fruits, 4,324 packages of dried, and 1,732 packages of honey were exported to oversea markets. These were consigned as follows:—For London, 12bush. of apples, 600 packages of dried fruit, 997 packages of field peas, and 1,732 packages of honey; for New Zealand, 1,450 packages of dried fruit and 225 packages of fresh fruit; Durban, 2,276 packages of dried fruit; 170 packages of dried fruit and 1,630 packages of jam were rejected, the latter through being short weight, and the former on account of the presence of fruit moth. Under the Federal Quarantine Act, 902 packages of seed, &c., were examined and admitted from oversea markets, 174 packages of dried fruit, &c., were fumigated on account of the presence of insects.

During the month of March, 1918, 515bush. of fresh fruits, 3,227bush. of bananas, 452bush. of pineapples, 157bush. of passion fruit, 11,175 bags of potatoes, 2,894 bags of onions, 88 packages of plants, bulbs, &c., and 902 empty wine casks were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Act, 1885 and 1910; 164bush. of bananas (overripe) were destroyed; 55 wine casks and 72 empty cases were fumigated, and 282 bags of potatoes were returned to Victoria, and 54 bags of potatoes were destroyed. Under the Federal Commerce Act 281 packages of dried fruit and 241 packages of fresh fruits were exported to oversea markets. These were consigned to New Zealand. Under the Federal Quarantine Act, 279 packages of seeds were examined and admitted from oversea sources; 2 packages of seeds from Italy were destroyed on account of the ravages of weevils.

#### Ages of Horses and Sheep.

In reply to an inquiry as to the method of determining the ages of horses and sheep, the Government Veterinary Lecturer states:—Details as to the appearances of the teeth in horses and sheep can hardly be compressed into a letter of reply; but the two accompanying tables will give you dates when milk and permanent teeth are out. The Agricultural Department, New South Wales, publish a very useful bulletin on the age of the horse, with good plates, and I would advise you to send them a 1s. postal note for a copy. The plates will show you the alterations in the marks on the lower incisors between 5 and 8 years, also the alterations in the tusks to a later age, and the fitting of the incisors of both jaws as indicating advancing age, together with the alterations that occur on the tables of the lower incisors. You should have no difficulty in recognising the milk and permanent teeth of either horse or sheep, as the milk are small, white, and pearly, and the permanent much larger and yellower.

*Sheep.*—The times of cutting vary very much according to breed, feed, and general conditions, but in South Australia are approximately those given in the table. The incisors, which exist only in the lower jaw, are those by which age is reckoned. These are eight in number, and work against the fibrous pad of the upper jaw as in the cow. To examine the teeth, hold the sheep's head against your thigh with one hand and part the lips with the first and second fingers of the other hand. By the time the lamb is four weeks old it will have eight small milk incisors, which, of course, will wear on the surface as time goes on. At about a year the central pair will be replaced by bigger permanent teeth; then the sheep or hoggett is called two-tooth. At about two years the next, called middles, are replaced, and it is four-tooth. At nearly three years it becomes six-tooth, and about four it is full-mouthed. As it grows older the teeth are worn down, broken, or lost, and the sheep is termed broken-mouthed. I know a ewe 23 years old with four incisor stumps still in the mouth. As mentioned above, the time of cutting and the amount of wear vary much according to conditions. In your district

they are cut fairly early, and the wear is tremendous; sheep are often broken-mouthed before they are full-mouthed; but a little careful observation will show you how this occurs, and the marked difference between milk and permanent teeth will prevent you being led astray. One never worries about the molar teeth in the living sheep, but it is of some interest to examine them when opportunity occurs in the dead one.

| <i>Dentition of Horse.</i> |    |                |    |          |
|----------------------------|----|----------------|----|----------|
|                            |    | Cutting.       |    | Change.  |
| Incisors—                  |    |                |    |          |
| Central                    | .. | Birth          | .. | 2½ years |
| Lateral                    | .. | 1-2 months     | .. | 3½ years |
| Corner                     | .. | 7-8 months     | .. | 4½ years |
| Molars—                    |    |                |    |          |
| First                      | .. | } At birth     | .. | 2½ years |
| Second                     | .. |                |    | 3 years  |
| Third                      | .. |                |    | 3½ years |
| Fourth                     | .. | About 1 year   |    |          |
| Fifth                      | .. | About 2½ years |    |          |
| Sixth                      | .. | 3½-4½ years    |    |          |
| Tusks                      | .. | About 4½ years |    |          |

| <i>Dentition of Sheep.</i> |    |                                 |         |                       |
|----------------------------|----|---------------------------------|---------|-----------------------|
|                            |    | Cutting.                        | Change. |                       |
| Incisors—                  |    |                                 |         |                       |
| Central                    | .. | } At birth or within<br>a month | }       | About 1 year          |
| Middle                     | .. |                                 |         | About 2 years         |
| Lateral                    | .. |                                 |         | Between 2 and 3 years |
| Corner                     | .. |                                 |         | Between 3 and 4 years |
| Molars—                    |    |                                 |         |                       |
| First                      | .. | } At birth or soon<br>after     | }       | Soon after 18 months  |
| Second                     | .. |                                 |         | About 2 years         |
| Third                      | .. |                                 |         |                       |
| Fourth                     | .. | 3 months                        |         |                       |
| Fifth                      | .. | 9 months                        |         |                       |
| Sixth                      | .. | 18 months                       |         |                       |

### FEATHER-EATING FOWLS.

Feather-eating is a vice which is very difficult to cure, says the Poultry Expert (Mr. D. F. Laurie). If the birds are in confinement all grain, &c., should be fed in straw or other litter. The scratching provides occupation. A little salt should be added to the wet mash (if fed). Animal food, such as meat, scraps, or rabbits (boiled) should be fed several times a week. The trouble is often due to food deficiencies.

## INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture, Adelaide.*"

### VETERINARY INQUIRIES.

[Replies supplied by Mr. F. E. PLACE, B.V.Sc., M.R.C.V.S., Veterinary Lecturer.]

"D. E. S.," Ashbourne, has horse with injury to knee.

Reply—This swelling is an injured synovial sheath, and quite possibly the operation of aspiration will be required to reduce it, so that I would advise you to place it in a veterinary surgeon's hands for treatment. In the meantime relief may follow the daily rubbing in of a little oleate of mercury 20 per cent. strength.

"E. M.," Bool Lagoon, via Naracoorte, has horse with swelling under chest.

Reply—The symptoms all point to various kinds of worms, and I would suggest that you put the horse on bran mash for a couple of days, and then give a 3-drachm physic ball; when this has worked off, and, of course, the horse must have a spell while it is doing so, give him a tablespoon of Fowler's solution of arsenic twice a day for a fortnight; stop a fortnight, and repeat again.

"J. B. C.," Mundoorra, has colt, stiff, with slight cough, and mare scouring.

Reply—The colt is probably foundered from some cause not recognised by you. I would advise putting him in wet, marshy ground and giving 20 drops tr. aconite morning and evening for a fortnight or three weeks. The mare's liver seems to be out of order, and I think it would be a good plan to give her ½ pt. of castor oil in milk, and then three times a day for a week a teaspoon of sal ammoniac in feed.

"H. A. W.," Ardrossan, reports death of pony, and asks instructions as to feeding.

Reply—The death of your pony would appear to be due to bloodworms, which are probably the cause of the symptoms in the other. I would advise giving two tablespoons of Fowler's solution of arsenic once daily in feed for a fortnight; stop a fortnight, and repeat. Feed should be about 20 lbs. chaff or hay daily with 4 lbs. to 6 lbs. oats added. Water before feeding, and clear bowels by giving ½ pt. castor oil in warm milk occasionally; this will stop the dung-eating habit. There may be a certain amount of sand at the bottom of the trouble, too.

"A. L. W. G.," Glen Ness, Sandalwood, has gelding with lump on shoulder.

Reply—The method of lancing which is necessary and the dressing required have often been given in detail in the *Agricultural Journal*. Although I am pleased to demonstrate such operations at Bureau meetings, the Government does not supply veterinary surgeons for the purpose, and it would be well to employ a private practitioner if you deem this horse of sufficient value.

"E. M. W.," Yallunda Flat, seeks information concerning flies in sheep paddock. Mr. Lea, the Government Entomologist, replies as follows:—Common name, bladder flies; scientific, *Pterodontia mellii*. They are parasitic on spider egg masses, and do no harm to sheep—possibly they are a benefit. They get their common name from the smallness of the head as compared with the body—it is the tiny brown blob in front. Their scientific name records the tooth-like process on the wing and their black color.



"J. U.," Murray Bridge, has heifer with blood about top of tail, and due to calve in a fortnight.

Reply—I am afraid in this case advice will come too late, as all the symptoms point to dystokia, or difficulty in calving on account of misplacement of the calf. The procedure would have been to examine with a well-greased hand, and to have tried to place the calf in position, and have helped with traction. If she has calved, then 10 drops tr. pulsatilla morning and evening will help; this may be given for a week.

"W. J. C.," Brooker, had two calves, discharge from nostrils, froth from mouth, and glaring eyeballs. Both finally died.

Reply—The symptoms suggest poison-weed, such as euphorbiuim, in the paddocks; but at any time stubble feed alone is unsuitable for such young calves, and you have done wisely in taking them in. As apparently you have no milk for them, I would advise crushed oats 2lbs., bran 4lbs., linseed meal ½lb., with as much hay as they will eat; but green feed, with the same amounts of concentrates, would be better. If any more get ill, give ½pt. of castor oil in warm milk.

"H. C. J.," Colton, has horse with bad cough.

Reply—Your horse has apparently got a severe cold, possibly influenza, and must have a spell from work till quite better to avoid inflammation of the lungs setting in. Feed on hot bran mash only for a few days. Steam head with a teaspoon of eucalyptus oil occasionally, and give 10 drops tr. aconite three times a day. A little Stockholm tar and honey may be smeared on the teeth twice a day.

"S. Bros.," Lower Light, have colt with chronic strangles.

Reply—It would be well to give your colt a drachm of iodide of potassium once daily in bran. Also rub a little blue mercurial ointment into the enlarged glands daily. But if you value him, I would strongly advise calling in a private veterinary surgeon, as there are possibly complications following the pneumonia that require special treatment.

"Wm. M.," Crystal Brook, has pony with staked wound that will not heal.

Reply—It is practically certain that there is a foreign body, such as a splinter or dead tissue, at the bottom of the wound, which will not heal till that is removed. I would therefore advise opening up and converting the staked wound into an open one, removing the tissue or splinter, and then treating daily with spirit of iodine. If you value the pony sufficiently, I would recommend calling in a private veterinary surgeon.

"M. H. P.," Georgetown, reports ewes heavy in lamb dying.

Reply—You ewes are probably suffering from a germ which produces the symptoms. Try shifting from paddock to paddock every three days. Give Cooper's tablets (Elder, Smith, & Co.). Hand feed 1lb. chaff daily, and bleed affected ones.

"E. E. H.," Port Broughton, has gelding with enlarged thyroid, also a gelding that slobbers.

Reply—Your diagnosis is quite correct. The swelling is goitre, and treatment is more tedious than results warrant; but if you care to try inject ½oz. tr. iodine into the swelling once a fortnight, rub in blue mercurial ointment every day; obtain the thyroid glands from sheep, mince one and feed one daily to the horse. Treatment will probably have to extend over a year or more. Try a tablespoon of Fowler's solution of arsenic and a teaspoon of baking soda in feed twice a day for the slobbering horse for three weeks. Examine mouth carefully for grass seeds.

"E. S.," Riverton, has cow slowly losing condition.

Reply—I fear that little can be done for the old cow, which is suffering from a failure of vital energy common under such circumstances. She has been paying out more than has been absorbed. If the medicines given are nux and arsenicum, keep on with them.

"A. G. H.," McLaren Vale, has mare almost totally blind.

Reply—The blindness is caused by a congestion of the cerebral blood vessels. Relief would be obtained by bleeding well at the neck and giving 10 drops tr. belladonna twice daily for 10 days. If you value her, I would advise calling in a private veterinary surgeon.

"G. L. N.," Mount Bryan, reports mare very weak in hindquarters, with difficulty in rising after lying down.

Reply—The symptoms of your mare point to an attack of laminitis. I would advise giving her 10 drops tr. aconite three times a day for a fortnight, and putting her in a paddock where she can stand with her feet in mud over the hoof heads for some hours daily. The Fowler's solution will do more good later on.

"F. W. D.," Springton, has a horse with wolf's tooth.

Reply—Do not worry about the wolf's tooth, it will do no harm; but if you are very keen on getting it out, cut a V-shaped notch in the end of a shoeing rasp, put it in a little sideways on the tooth, and hit hard with a 4lb. hammer or heavier; then pull tooth out with pincers.

"B. J. S. N.," Angaston, reports sow with hard lump on teat.

Reply—The swelling you refer to is an indurated gland; it will do no particular harm if left alone, but if you wish to you might inject eucaine and lemisine and dissect it out, treating the operation wound with sulphur and boracic acid after.

"N. McL.," Mena Murtee, Wilcannia, N.S.W., further reports on blind young horses, through eating paddy melons.

Reply—As feared, treatment is not likely to do much good; but experimentally the horses might be bled at the jugular. Burroughs, Wellcome, & Co. put up an ophthalmic tabloid of elaterin which might be put into the eye occasionally, and the effect noted. Also experimentally, tr. elaterin might be alternated daily with tr. colocynth, both drugs in sixth potency, and 10 drops given twice daily; but such treatment is purely tentative. Practically nothing can be done in the way of treatment.

"C. M. W.," Netherton, Yumali, reports foals stiff in front and hind legs.

Reply—Thistles do provoke the symptoms described in your letter of 5th instant, to hand to-day; but I fancy that worms are also causing the mischief you describe. I would advise giving each foal 3lbs. of crushed oats, with 1lb. of chaff, daily, and put a tablespoon of Fowler's solution of arsenic in it for three weeks.

"G. H.," Mildura, has gelding, hunter, that wears toe, and rests hind leg, brushes, and has large offside fetlock.

Reply—A personal examination would be necessary to make a correct diagnosis, but from the symptoms described, I fancy the hock is involved, as is frequently the case in old jumpers. The class of shoe you described, short rolled toe and raised heels, would give relief, and probably minimise the brushing also. The cabman's boot, a strip of folded felt, would protect the joint satisfactorily. As the stiffness is chronic, there would be no advantage in stopping him from jumping. Arnica lotion after jumping would be an advantage to him.

"W. W.," Yurgo, via Karoonda, reports draught gelding, 8 years, with lump and sores on shoulders.

Reply—The best remedy for the lump is to have it surgically removed, when it would be of no further trouble. Failing this, keep it well lubricated with neatsfoot oil and white lead, and have a collar chambered over it. You might find a wooden collar, well oiled, would suit.

"A. G.," Kadina, reports blood mare, staked offside forearm, recovered, walks sound, but is lame at work.

Reply—It is possible some other cause of lameness has occurred during the time she has been recovering from the stake; but if this is not so, try rubbing in a little oleate of mercury, 20 per cent., daily after fomenting, and keep up steady work at the same time. If this does not put her right, communicate with me again, and state if you notice any swelling or tenderness below the knee.

"E. O. D.," hundred O'Loughlin, Denial Bay, has mare with open and running sore on wither.

Reply—The symptoms described point to the mare being affected with fistula; full description of treatment necessary has often appeared in the *Agricultural Journal*, but no treatment will be of any good unless the fistula is opened up right to the bottom and then treated antiseptically as formerly described.

"T. S.," Tantanoola, reports cow, udder cut by barbed wire and kicked with horse.

Reply per telegram as follows:—"Paint udder with tr. iodine and friar's balsam daily." I think you will find considerable improvement from such treatment, and if necessary, on account of wetness of wound, you may do well to dust occasionally with chloride of lime one part and boracic acid seven parts. If she does not do to your satisfaction, write again.

"W. T.," Borrika, has horse with light-blue film over eye.

Reply—The symptoms point to some injury to the cornea or front of the eye, and it is probable that if you can dress it with a solution of nitrate of silver, 5grs., to distilled water, 1oz., injecting a few drops daily, that it will slowly improve.

"G. E.," Orange Avenue, Mildura, has filly with lump between jaws and pony with cough.

Reply—Filly probably has enlarged thyroid gland. Inject tr. iodine into it once and rub daily with ung. hydrarg. for fortnight or so. Give mere. viv. internally. Pony's cough is probably chronic; try kali bichrom. twice daily.

"C. N. A. B.," Brentwood, has filly with hard lump on shoulder.

Reply—The lump on the filly's shoulder is a subcutaneous glandular enlargement, frequently referred to in detail in these replies. Treatment—Incise at lower back of lump, remove core (gland), dress with tr. iodine till well. Work during healing.

"J. & S.," Woodlands, Port Pirie, report horses fed on bearded hay suffering from sore mouths.

Reply—The symptoms point to injury to the soft tissues of the mouth by beards and seeds, and the mouths should be well searched, and any such accumulations removed by forceps; an astringent wash is then advisable, such as a teaspoon of alum in a whisky bottle of water. Bearded hay, when fed long, does injure the month and stomach; but the same result often happens when it is chaffed also. Much more damage accrues from grass seeds.

"J. S.," Tooperang, has heifer, calved five weeks, only giving half of usual quantity of milk.

Reply—Is it not possible that the sudden falling off is due to the heifer coming in heat, in which case it will only be a temporary matter. Or it may be that she has caught a chill; if this is so, then I would advise a laxative and stimulant, say, 12ozs. Epsom salts in a quart of warm beer. If there is any local tenderness in the udder, rub well with hot soapsuds, rubbing dry after.

"W. H. L.," Clare, reports mare, in good condition, that shows uneasiness and timidity when approached. The nervousness is most noticeable when approached from the off side. The off side eye has a bluish-white centre.

Reply—It is very gratifying to find that my remarks about the estroptic test have not fallen on deaf ears. I must congratulate you on the very lucid description of symptoms, which enables me to answer your inquiry with confidence. Off eye—Cataract affecting lens throughout, opacity of vitreous humor of a constitutional nature. Near eye—Cataract in less advanced stage, with similar degeneration in vitreous humor. Has this mare been on paddy melons? I should imagine she has, and the condition has been brought about by the colocynth and elaterin they contain. Cataract is classed as an hereditary unsoundness like those you mention. Treatment would be tedious and unsatisfactory. Internal degeneration of the structures of the eye frequently results in the conditions noticed. As an experiment it might be worth your while giving 10 drops of tr. colocynth 3x. morning and evening for a month in feed, and watching the near eye for possible improvement. Local treatment of the eyes would be useless unless surgical, and then unsatisfactory.

"S. C.," Toxteth, Mypolonga, reports sow with swollen throat.

Reply—The swelling described in the sow's throat is probably a glandular abscess of the nature of mumps, and if it ripens it is well to lance, evacuate, and swab out with antiseptic, such as Condy, and give a teaspoon of photographer's hypo in each feed for a few days. As there is always a possibility

that such glandular enlargements may be connected with tuberculosis, it would be well to ask the Stock Inspector at Talem Bend to have a look at it when he is in your neighborhood.

"R. J. G.," Avondale, Cradock, reports ewes in lamb become very weak in hind quarters and finally succumb. Also colt that has injured his back.

Reply—From the symptoms you so well describe I am afraid you are up against it with the ewes. The trouble is a form of toxæmia, brought about by a combination of factors, which are the drain on the system of carrying lambs, a protozoan parasite known as sarcosporidia, a bacterium known as bac. sporogenes, and chemical changes in the drying feed; the blindness and the scouring are secondary effects of the primary trouble. Treatment to be successful should be preventive, and where possible include hand feeding with grain and bran. It is late in the day to begin to treat when the symptoms have become marked. Licks consisting of four parts bonemeal, one saltpetre, 1/10 sulphate, or, better, carbonate of iron, will be of use. In addition to bleeding, give Cooper's tablets; the arsenic they contain will be useful. Change pasture every few days if possible, and spray bush with lime; both these last may seem impracticable, but will pay, especially the lime cart. The colt has injured the loins, probably the blood vessels near the kidneys. Give 10 drops tr. arnica twice a day for a fortnight or so, rub loins daily with mild liniment containing 5 per cent. tr. arnica, and have patience; he will probably come round, but take a long time over it. When he can get up alone, give a tablespoon of compound syrup of phosphate of iron twice a day in bran for three weeks or so.

"F. C. T.," Mouquet Farm, Meribah, had yearling colt, froth issuing from nose; two hours later death followed.

Reply—The symptoms, especially the scouring, froth, and quick death, point to the colt having grazed on a weed common in your part of the world, *Gyrostemon cyclothea*, commonly known as cress or buckbush, which generates prussic acid when eaten, and brings about the symptoms both before and after death which you noted. A fairly full note on the plant appeared under the title of "Cress" in the *Agricultural Journal* two or three years ago. I am glad to hear the previous cases recovered.

#### AGRICULTURAL INQUIRY.

[Reply supplied by the Superintendent of Experimental Work, Mr. W. J. SPAFFORD.]

In the Rockleigh district, the best time to apply fertilizers to grass land is in the late autumn or early winter. It is practically impossible to say what is the best manure and the quantity to use without knowing the peculiar conditions of the particular field to be fertilized; but in a general way you will find an application of superphosphate very profitable, and in most cases to be all that is necessary. If the soil does not contain an excess of lime this substance should be used. Without knowing your particular conditions I should say your best chance of success lay by fertilizing the grass as follows:—(1) If soil does not contain an excess of lime, 1cwt. to 2cwts. of superphosphate and 5cwts. lime every autumn, the lime to be broadcasted about one month before the superphosphate. This can be varied by applying 1 ton of lime per acre every five years and the superphosphate annually. (2) If there is plenty of lime present it is only necessary to apply superphosphate. (3) Any farmyard manure that is available can be used with advantage on the pasture in conjunction with superphosphate.

#### POULTRY INQUIRY.

[Reply supplied by the Government Poultry Expert, Mr. D. F. LAURIE.]

"W. H. S.," Eureka, had about 100 turkeys running in a 20-acre paddock in which there was a stack of slightly mouldy hay. Two weeks ago trouble manifested itself; the birds affected shook their heads, sat down, were unable to rise. Their mouths were full of slime, and in from 12 to 24 hours the birds died.

Reply—Are the roosting places occupied by the turkeys infested with poultry ticks? If so they should be drenched with kerosine 1 part, boiling soap 9 parts. If no ticks are to be found (by searching the woodwork), then the cause may be due to eating mouldy hay or grain. Definite information cannot be given on this point without careful post-mortem examination.

## ROSEWORTHY AGRICULTURAL COLLEGE HARVEST REPORT—1917-1918.

[By W. J. COLEBATCH, B.Sc. (Agric.), M.R.C.V.S., Principal of  
Roseworthy Agricultural College.]

*(Continued from page 634.)*

### THE PEA CROP.

Early Dun pease are very well adapted to Roseworthy conditions, and they thrive in years of fair rainfall, provided they be sown sufficiently early and on land in good heart. The winter being relatively warm in this locality, the early growth is very rapid, and pease are inclined to make more haulm than the roots can maintain in a short, dry spring. Even in a moist, cool spring we can never expect to raise pease as successfully as the southern growers. Pease grown on the mallee lands will generally be less plump, and the losses in harvesting will be heavier. Moreover, in drouthy years the crop will most probably fail altogether. Nevertheless, pease are always worth the growing on account of their ameliorating influence on the land and for their value as grazing. Where the crop is grown for grain, there is a danger of the pea and hay harvests overlapping; but the area of the former is usually very small in the wheat-growing districts, and on an ordinary mixed farm 4 or 5 acres would supply all the seed grain required for the ensuing year.

In favor of the pea crop it may be pointed out that it does not need fallowed land, but can be grown successfully if sown early in June or at the end of May on an autumn-ploughed seed bed. Our practice is to complete the cereal seeding first, and then to lift a field known to be in good condition, and seed it with field pease (2bush. per acre), and 36/38 superphosphate (2cwt. per acre).

Last year we grew pease on 63.441 acres, but the crops in No. 7b (22.443 acres) and Pig paddock B (3.658 acres) were used for grazing. The harvested crop was grown in Ebsary's C, and yielded 21bush 7lbs. per acre over 37.34 acres, or 788bush. 27lbs. in all. By the appearance of the crop a higher yield was foreshadowed, but the spring proved too hot for the production of well-filled pods of large-sized grain. This untimely checking of the vital processes hindered the translocation of nutrients from stem and leaf to the developing grain, and thereby resulted in the gathering of pea straw of exceptionally good quality.

The feeding value of this straw was evidenced by the marked improvement in condition shown by a herd of young horses that was turned on to the stubble. The average grain yield for the past two seasons was 25bush. 56lbs. per acre.

### THE BARLEY HARVEST.

The barley crop of 1917 was the heaviest ever harvested at the College. Up to the present we have confined ourselves to the square-headed and six-rowed types in the farm fields, the malting or two-rowed varieties being grown in single rows only for identification purposes. Many of the farmers in this district, attracted by the higher values that are placed by maltsters and brewers on the two-rowed types, have grown crops of Prior and Chevalier with success, and I have no doubt that in favorable seasons malting barley of good quality can be raised on the lighter soils not far removed from the sea coast. There can, however, be no gainsaying the fact that the hardier types of barley are better suited to a climate which is unfavorable to the ripening processes of slowly-maturing grains. Of the two-rowed kinds, the erect eared would do better than the nodding eared barleys, and where malting barley can be regularly grown north of Adelaide, these will probably come into favor. The point to be considered, however, is whether improved types of the more prolific four and six rowed barleys would not be more profitable over a period of years. The growers in the North have the advantage of being first on the market with their barley, and consequently they may catch the buyers short; but those who are prepared to pay high prices cannot afford to buy largely of any but the best quality, and, moreover, the vicissitudes of the weather render it impossible for a regular supply of a high-class sample to be maintained. Hence it appears to me that if barley is to occupy a permanent and prominent place in the agricultural system of this district, chief reliance will have to be placed on the more drought-resisting and more prolific varieties, rather than on the types that yield prime malting samples.

We have two well-established pedigreed square-eared barleys at the College, and six comparatively recent introductions from Tunis.

Of these new barleys three are early types (Nos. 1, 2, and 3), one (No. 6) is a late variety, and the remaining two (Nos. 4 and 5) come to maturity about a fortnight later than the early kinds. The late variety is a strong-growing, square-eared type, which develops a light-colored, clear-skinned, plump grain of high quality, and will usually command approximately the same price as two-rowed barley. It is a variety that is well worth trying even in districts where malting barley constitutes the main cereal crop.

The treatment meted out to the 1917 barley crops was such as, under normal circumstances, would call for severe condemnation; but in view

of the season, and of the results obtained, it is clear that the decision to adopt unorthodox but more expeditious methods of seeding was a wise one. The appended table shows the summarised results of the barley harvest.

TABLE XIII.—*Showing Details of Barley Harvest, 1917.*

| Field.            | Area.<br>Acres. | Total Yield.<br>Bush. lbs. | Acre Yield.<br>Bush. lbs. |
|-------------------|-----------------|----------------------------|---------------------------|
| Flett's . . . . . | 110.574         | 4,644 8                    | 42 0                      |
| No. 4 . . . . .   | 5.915           | 179 4                      | 30 17                     |
| No. 16 . . . . .  | 9.564           | 334 36                     | 35 0                      |
| Totals . . . . .  | 126.053         | 5,157 48                   | 40 46                     |

## FLETT'S FIELD.

## Prior History:

|                 |                        |                        |
|-----------------|------------------------|------------------------|
| 1902 .. Fallow  | 1908 .. Wheat          | 1913 .. Wheat, barley, |
| 1903 .. Wheat   | 1909 .. Pasture        | oats, rye              |
| 1904 .. Fallow  | 1910 .. Fallow         | 1914 .. Barley         |
| 1905 .. Wheat   | 1911 .. Wheat, barley, | 1915 .. Wheat          |
| 1906 .. Pasture | oats                   | 1916 .. Pasture        |
| 1907 .. Fallow  | 1912 .. Fallow         |                        |

This is a field of 175 acres of light land, which grew an average of 2 tons 12cwts. 21lbs. of hay in 1915. In April of 1917 a block of 116 acres was turned over with disc ploughs to a depth of 5in. The land lay in the rough till the following June, the autumn growth being kept down by sheep. Between June 11th and June 15th, 4½ days in all, 50lbs. of seed barley was broadcasted, with the usual 2cwts. of standard superphosphate through the drill, and cultivated in. This completed the work of seeding, and no other attention was given to the crop till harvest, when it was bound and put through the thresher. The College barleys—Shorthed and Oregon—averaged over 50bush. to the acre, and 14 bags of grain per acre were obtained from the whole field.

TABLE XIV.—*Showing Particulars of Barley Harvest in Flett's, 1917.*

| Variety.           | Selection. | Area.<br>Acres. | Total Yield.<br>Bush. lbs. | Acre Yield.<br>Bush. lbs. |
|--------------------|------------|-----------------|----------------------------|---------------------------|
| Oregon . . . . .   | 9          | 9.780           | 494 18                     | 50 27                     |
| Shorthed . . . . . | 10         | 45.167          | 2,259 12                   | 50 1                      |
| Tunis 1 . . . . .  | 1          | 7.132           | 282 21                     | 39 30                     |
| Tunis 5 . . . . .  | 1          | 14.705          | 563 23                     | 38 16                     |
| Tunis 2 . . . . .  | 1          | 7.505           | 275 46                     | 36 38                     |
| Tunis 6 . . . . .  | 1          | 9.780           | 303 47                     | 31 4                      |
| Tunis 4 . . . . .  | 1          | 7.115           | 216 31                     | 30 22                     |
| Tunis 3 . . . . .  | 1          | 9.390           | 248 10                     | 26 22                     |
| Totals . . . . .   |            | 110.574         | 4,644 8                    | 42 0                      |

The balance of the barley crop—15.479 acres—was grown in experimental fields Nos. 4 and 16, and the yield obtained from it was approximately equal to the mean barley yield for the past 14 years.

TABLE XV.—*Showing Yielding Capacity of Chief Barleys Grown at Roseworthy College.*

| Variety.                    | 1915. |      | 1916. |      | 1917. |      | Mean Yields. |      | Period. |
|-----------------------------|-------|------|-------|------|-------|------|--------------|------|---------|
|                             | Bush. | lbs. | Bush. | lbs. | Bush. | lbs. | Bush.        | lbs. |         |
| Tunis 1 . . . . .           | 51    | 12   | 51    | 14   | 39    | 30   | 47           | 19   | 1915-17 |
| Tunis 4 . . . . .           | 66    | 29   | 36    | 44   | 30    | 22   | 44           | 32   | 1915-17 |
| Tunis 6 . . . . .           | —     | —    | 56    | 41   | 31    | 4    | 43           | 48   | 1916-17 |
| Tunis 5 . . . . .           | 57    | 18   | 31    | 4    | 38    | 16   | 42           | 13   | 1915-17 |
| Tunis 2 . . . . .           | 37    | 8    | 50    | 44   | 36    | 38   | 41           | 30   | 1915-17 |
| Shorthead . . . . .         | 49    | 49   | 13    | 49   | 32    | 28   | 41           | 8    | 1908-17 |
| Roseworthy Oregon . . . . . | 54    | 30   | 9     | 11   | 35    | 41   | 40           | 14   | 1908-17 |
| Tunis 3 . . . . .           | 39    | 6    | 29    | 48   | 26    | 22   | 31           | 42   | 1915-17 |

In the above table are included the yields of the latest selections only. The Tunisian barleys have only been grown since 1915, whereas the Shorthead and Roseworthy Oregon varieties have been cultivated here since 1908.

#### AVERAGE BARLEY YIELD.

TABLE XVI.—*Showing General Average Barley Yields on the College Farm, 1904-1917.*

| Season.        | Rainfall. |         | Area.   | Average Yield per Acre. |
|----------------|-----------|---------|---------|-------------------------|
|                | “Useful.” | Total.  |         |                         |
|                | Inches.   | Inches. | Acres.  | Bush. lbs.              |
| 1904 . . . . . | 11.60     | 14.70   | 27.86   | 38 33                   |
| 1905 . . . . . | 14.23     | 16.71   | 65.73   | 25 4                    |
| 1906 . . . . . | 16.31     | 19.73   | 51.00   | 40 38                   |
| 1907 . . . . . | 13.96     | 15.13   | 79.30   | 31 21                   |
| 1908 . . . . . | 15.52     | 17.75   | 94.83   | 43 49                   |
| 1909 . . . . . | 21.15     | 24.05   | 75.27   | 35 0                    |
| 1910 . . . . . | 16.79     | 23.87   | 113.42  | 37 9                    |
| 1911 . . . . . | 9.45      | 13.68   | 76.09   | 39 31                   |
| 1912 . . . . . | 13.05     | 14.97   | 123.82  | 22 21                   |
| 1913 . . . . . | 10.82     | 15.66   | 91.09   | 12 19                   |
| 1914 . . . . . | 6.12      | 9.36    | 12.85   | 2 26                    |
| 1915 . . . . . | 18.33     | 19.76   | 24.44   | 41 40                   |
| 1916 . . . . . | 20.25     | 23.23   | 128.198 | 12 15                   |
| 1917 . . . . . | 17.25     | 21.86   | 126.053 | 40 46                   |

Mean for 14 years . . . . . 30 14

The effect of the season's barley return has been to raise the general average since 1904 from 29bush. 24lbs. to 30bush. 14lbs. This means an increase of 40lbs. per acre.

A mean yield of 30bush. per acre, valued at 2s. 6d. per bushel, brings in £3 15s. per acre from land that has not been fallowed, and hence the possibility of using barley to increase the revenue, without materially adding to the general expenditure, should not be overlooked. The whole of the College crop, averaging 40bush. to the acre, was saleable this season at an all-round price of 3s. per bushel on trucks, Roseworthy, and hence a gross return of £6 per acre from grain alone could have been obtained.



## THE OAT HARVEST.

Approximately 60 acres were sown with oats, but only 20.876 acres were harvested for grain. The original intention was to grow a quantity of pure seed oats for sale, but in consequence of the damaging effect of red rust, all but an acre of the Scotch Grey variety had to be cut for ensilage or hay. Of the other two varieties sown, Sunrise, a tall-growing oat, yielding a light-colored grain, gave an average return of 21bush. 7lbs., whereas the Algerian Tartars yielded only 7bush. 12lbs. These figures, however, are misleading, as they point to differences in capacity to hold the grain rather than to produce it. The crops were allowed to stand too long before being harvested, and consequently the losses incurred were unusually heavy. This is to be regretted, as the Algerian Tartars gave promise of a yield of at least 12 bags to the acre; but owing to the demands of other fields, the oat crop, which is of secondary importance in this district, had to be sacrificed. The Sunrise oat is a very rapid grower, and I believe it would benefit by being grazed back in the winter, and thus forced to shoot out and bear more heads.

In the appended table is shown the general average oat yield for the period 1905-1917:—

## AVERAGE OAT YIELD.

TABLE XVII.—*Showing Average Yields of Oats on the College Farm, 1905-17.*

| Season.        | Rainfall.            |                   | Area.<br>Acres. | Yield<br>per Acre.<br>Bush. lbs. |
|----------------|----------------------|-------------------|-----------------|----------------------------------|
|                | "Useful."<br>Inches. | Total.<br>Inches. |                 |                                  |
| 1905 . . . . . | 14.23                | 16.71             | 20.00           | 43 10                            |
| 1906 . . . . . | 16.81                | 19.73             | 33.50           | 41 18                            |
| 1907 . . . . . | 13.96                | 15.13             | 20.00           | —                                |
| 1908 . . . . . | 15.52                | 17.75             | 20.00           | 22 28                            |
| 1909 . . . . . | 21.15                | 24.05             | 23.52           | 43 19                            |
| 1910 . . . . . | 16.79                | 23.87             | 24.60           | 28 15                            |
| 1911 . . . . . | 9.45                 | 13.68             | 22.82           | 22 8                             |
| 1912 . . . . . | 13.05                | 14.97             | 52.00           | 10 4                             |
| 1913 . . . . . | 10.82                | 15.66             | 3.33            | 11 36                            |
| 1914 . . . . . | 6.12                 | 9.36              | —               | —                                |
| 1915 . . . . . | 18.33                | 19.76             | 1.10            | 32 32                            |
| 1916 . . . . . | 20.25                | 23.23             | 6.36            | 27 15                            |
| 1917 . . . . . | 17.25                | 21.86             | 20.88           | 14 25                            |

Average for 11 years (omitting 1907 and 1914) . . . . . 27 5

\* Complete failure from feeding off with sheep.

## RYE CROPS.

A small block of rye is grown each year to provide good thatching straw and at the same time furnish reliable information concerning the yielding capacity of pure strains under the Roseworthy conditions. Since 1909 we have had under observation four varieties. One of these, namely, March rye, is spring sown, and the other three are autumn

sown in humid countries. Our practice has been to sow them all on fallowed land in the early autumn, and allow them to mature their grain without being winter grazed. This year seeding took place on April 27th, in Field No. 16, under rather dry conditions. Pure graded seed (50lbs. per acre) and 36/38 grade superphosphate (2cwt. per acre) were drilled in, and the plots responded promptly to the early May rains. Being on light, sandy soil, all the varieties made vigorous growth, and the yield of straw was very high relatively to the grain yield. This has been our experience in most years, the rapid change in temperature during the spring being apparently inimical to heavy grain production, but without effect on straw yield, since the crop has usually attained full growth before the hot weather sets in. It will be seen from the appended tables that the mean return for the nine-year period 1909-1917 is only 11bush. 19lbs., although yields of 7 bags to 9 bags per acre have been obtained under favorable circumstances. Of the varieties tested March rye is the earliest to ripen, and it leads the others in grain production; the later varieties do not appear to possess any other advantages that would compensate for any reduction in grain yield.

TABLE XVIII.—*Showing Details of Rye Crops, 1917.*

| Variety.               | Area.  | Total Yield. |      | Acre Yield. |
|------------------------|--------|--------------|------|-------------|
|                        | Acres. | Bush.        | lbs. |             |
| Multicaule .. . . .    | 0.945  | 12           | 53   | 13 39       |
| Giant Winter .. . . .  | 0.773  | 7            | 53   | 10 16       |
| March .. . . .         | 0.403  | 3            | 46   | 9 27        |
| Schlanstedt .. . . .   | 0.715  | 5            | 36   | 7 50        |
| Average yield .. . . . |        |              |      | 10 39       |

TABLE XIX.—*Showing Yields Per Acre of Rye on College Farm, 1909-1917.*

| Season.                       | March Rye. |      | Multicaule Rye. |      | Giant Winter Rye. |      | Schlanstedt Rye. |      | Means. |
|-------------------------------|------------|------|-----------------|------|-------------------|------|------------------|------|--------|
|                               | Bush.      | lbs. | Bush.           | lbs. | Bush.             | lbs. | Bush.            | lbs. |        |
| 1909 .. . . .                 | 7          | 46   | 8               | 44   | 11                | 34   | 4                | 3    | 8 15   |
| 1910 .. . . .                 | 16         | 4    | 12              | 40   | 12                | 36   | 15               | 14   | 14 9   |
| 1911 .. . . .                 | 20         | 9    | 11              | 24   | 9                 | 45   | 9                | 48   | 12 43  |
| 1912 .. . . .                 | 15         | 6    | 11              | 22   | 11                | 4    | 10               | 13   | 12 0   |
| 1913 .. . . .                 | 11         | 49   | 11              | 42   | 12                | 0    | 7                | 0    | 10 36  |
| 1914 .. . . .                 | 3          | 20   | 3               | 11   | 0                 | 47   | 0                | 51   | 2 0    |
| 1915 .. . . .                 | 22         | 41   | 23              | 47   | 23                | 24   | 27               | 31   | 23 35  |
| 1916 .. . . .                 | 6          | 30   | 9               | 18   | 6                 | 31   | 7                | 19   | 7 52   |
| 1917 .. . . .                 | 9          | 27   | 13              | 39   | 10                | 16   | 7                | 50   | 10 39  |
| Means for nine years .. . . . | 12         | 32   | 11              | 44   | 10                | 51   | 10               | 1    | 11 19  |

(To be continued.)

## SOME SHEEP WORMS.

[A lecture delivered to the Agricultural Bureau of South Australia by the Government Veterinary Lecturer, Mr. FRAS. EVELYN PLACC, B.Sc., M.R.A.S.E., B.V.Sc., M.R.C.V.S.]

Until recently the low individual value of sheep has stood in the way of obtaining help from veterinary science in their behalf, but for more than half a century enormous loss in the aggregate has fallen on the flockmaster, through the happy-go-lucky idea that the best treatment for a sick sheep is to cut its throat or leave it to die or recover as chance may hap. Another bar to progress has been the idea that the flockmaster knew a great deal more about sheep than the vet., and this is perfectly true in South Australia when speaking of the local quack, but the science of parasitology has the advantage of being an exact science, one which deals with demonstratable facts, and for many years both in Australia and elsewhere parasitologists have both learnt and taught many valuable facts with regard to the worms which infest sheep, and I have no hesitation in saying are responsible for the majority of deaths, to say nothing of open, weak, and broken wool.

The parasitologist has no axe to grind; he is not out to sell perfect cures, but simply to state facts and show relationships between cause and effect, between worms and losses, and incidentally to point out the weak spots in the worms' armour.

On other occasions I have dealt in detail with fluke, and time will not permit me to occupy our attention with that particular parasite to-day. It is my intention to endeavor to throw a little light on the life, habits, and harm caused by other worms commonly spoken of as stomach and lung worms in sheep.

It may come as a shock to mutton eaters to learn that next to the dog, the sheep is the one animal among our farm stock that carries the largest number of parasites in its intestinal tract, and when we talk of tapeworms in lambs few of us realise that no less than 12 distinct species of tapeworm infest the sheep. But they are large and easily seen, and few of us have any notion how many different kinds of smaller worms trouble them, and many of us, having run a knife down the paunch and cast a casual glance at the contents, boldly declare there are no worms in the sheep, forgetting that there are other parts of its digestive tract, forgetting that there may be myriads of fine hair-like creatures under the mucous lining that require a magnifying glass to render them visible.

Another stumbling block in the path of knowledge is the quack habit of looking wise and declaring that the sheep have died of coasting, or were "coathed," or some other shibboleth is used to cloak ignorance and nip inquiry in the bud.

Another trouble is that a sheep is seldom supposed to be ailing until it is *in extremis*, and the idea that medical treatment is useless for a sheep has arisen from this want of perception, backed up by the fact that to sit a sick sheep up between one's knees and administer a jorum

of sticky, irritating fluid is a less skilful way of helping it out of its difficulties than severing its carotids and jugulars, but though less skilful generally just as effective.

#### A WIDESPREAD TROUBLE.

Every week from some part of the State I get letters describing the symptoms of sheep whose loss is causing the owner some perturbation. The symptoms run somewhat as follows:—"Sheep have been dying lately, they have been on good feed, and nothing is noticed wrong with them either before or after death." This much is to warn me that a wizard's skill will be necessary to elucidate the mystery. Then conscience speaks, and "Some of them have scoured on account of the feed: black, watery scour, and on the dung of some there is a slimy, blood-stained discharge. Others have seemed short of breath when moved, and have staggered before they fell." Rarely, very rarely, a post-mortem has been made, generally with the result that nothing has been found to account for death, and with a prescience that my verdict will be worms, a precise statement that there were no worms of any sort is added. Logic books tell us that a negative is useless to prove anything, and that is just the value I place on this one. Then scores of letters come saying that sheep have gone blind, and asking for local treatment. Scores of answers are sent, saying that the blindness is the result of parasitic anaemia, and treatment prescribed, which is followed by restoration of sight, but as one shrewd flockmaster remarked when thanking me for the successful treatment, "The ones that were not treated recovered too."

#### SYMPTOMS AND TREATMENT.

So we have two main lines of symptoms, those of acute gastro-enteritis, followed by numerous deaths in from one to three weeks. The other progressive anaemia, followed by death in acute cases and recovery in milder ones. We have the inter-weaving of the two in the general course of the trouble, which shows emaciation, diarrhoea (watery, black, and foetid, sometimes blood streaked), with anaemia following, shown by the weakness, bloodless condition of the eyes, and sometimes bottling under the jaw as in fluke; this is a secondary symptom, not, as many people think, a causal one, and the lancing of the swelling generally accredited with marvellously rapid effects is really of little practical good. Death may be rapid, occurring in a few hours, or may happen in one to three weeks, this being the usual time, and the post-mortem appearances are those of inflammation of the fourth stomach and bowels, with the bloodless condition of the vessels under the skin and watery frothy blood in the heart, which probably is surrounded by more fluid than usual; often there is a jelly-like effusion round the bowels.

The worms which so often escape detection will vary in length from 2.30 millimetres and be as thin as a hair (25mm. = 1in.), according to the species to which they belong. A good way of finding them is to scrape a little of the mucous lining of the fourth stomach or bowel, this lining will be found to strip easily when worms are present in numbers. Stir the scraping with a little water in a watch glass or

flat glass vessel standing on black paper or cloth. With the aid of an ordinary magnifying glass the worms will be easily recognised, and if a dissecting microscope with a magnification of 50 is available their peculiarities of structure may be studied.

Treatment of affected lambs or sheep will vary according to the sort of worm they are harboring, the stage of the disease, and the age of the sheep. Speaking generally, arsenic is the most useful drug, and a very convenient form in which to give it is Coopers' tablets, which enable one to give a stated dose without weighing, and their form enables one to slip them down the throat easily; the little extra cost is quickly repaid in time, labor, and sheep saved.

A cheaper way is to dissolve Coopers' powder dip in water, for lambs under three months a dessertspoon to a whisky bottle; dose, a dessertspoon of the solution. For older lambs or sheep a tablespoon of dip to a bottle; dose, a dessertspoon. An effective mixture is equal parts of dip and burnt bluestone, and give from 10-60 grains in a capsule. Licks are of great use as preventives, the more so if combined with hand feeding. A good general lick is made of salt 50, slaked lime 40, superphosphate 5, sulphate of iron 3, and sulphur 2 parts.

#### LIMING PASTURES.

It is more necessary to dress the paddocks than to drench the sheep, and the one great need of South Australian paddocks is lime in a form available to the plants. The pounds represented by dead or weak sheep would be well spent in liming, for not only would the feed be improved, but the parasites which undergo part of their development on feed would be destroyed. It may be urged that such a course is impracticable on sheep runs. That may be, but it is quite practicable for the sheep-raising farmer, who is theoretically coming so much to the front just now. In either case it is cheaper than growing worms and counting dead sheep. Not only do the worms deprive the sheep of blood by using it for their own nourishment, but when they pass it as dejecta from themselves it is in a poisonous form, and the toxins are readily absorbed by the damaged digestive tract, and are the cause of much mortality. There is no readier way of counteracting these toxins than by lime, either as a drug or in plant form.

A useful general worm drench for lambs is made of a teaspoon of turpentine with 10 drops each of lysol and chloroform and given in milk. These ingredients may be given to older sheep in larger quantities, four to eight times the amount. They will be found useful combined with chlorodyne in the scouring and dysenteric stages. In Canada the following is used:—Arsenious acid, 1 dram; sulphate of iron, 5 drams; nux vomica, 2 drams; areca nut, 2ozs.; salt, 4ozs. This powder makes 30 doses, once daily.

#### THE MISCHIEF MAKERS.

So much for the practical part; now a little theory in order to recognise the worms that do the mischief. The stomach worms of sheep are nematodes or round worms, mostly strongyles or wire worms. Often more than one species is found. Their home is the mucous lining of the stomach, in which they often escape observation by the untrained examiner.

Some seven or eight varieties are common in South Australia, one of the most frequent being *Strongylus cervicornis*, whitish hair-like worms 7-10mm. long. These worms may be easily overlooked on post-mortem if the naked eye alone is relied on when examining the fourth stomach and its contents. When a freshly dead sheep is examined the worms show lively movements, but if putrefaction has set in they will be shrivelled and dead, and will be found in the stomach contents rather than in the lining.

*Strongylus contortus* is a worm frequently sent for identification, 10-30mm. long, living in the lining of the fourth stomach, red or white or brown according to the state of digestion of the blood it has sucked. It is probably picked up at water holes and puddles, and may be found in thousands. Similar, but smaller, worms found with this one are *Str. filicollis* and *vicarius*.

*Str. convolutus* or *Ostertagi* is another common one in South Australia; yellowish-brown, 7-14mm. long, is found in small circular flat elevations on the epithelium, each pimple having a pinhole in its centre; after death the worms may be found leaving these nests. Similar to the last is *Str. Macfadyensis*, about 10mm. long; while *Str. gracilis* is only 3-4mm.

The bowels of the sheep form the home of numerous classes of worms, as has already been mentioned; a dozen species of tapeworm may be found in them. Three are common, and one, *Moniezia expansa*, very common. They may be found on the ground in quantities as the ordinary band-shaped tapeworm. Deaths from them are numerous. The symptoms, like those of most worm diseases, are indefinite. The skin and eyes are pale, the wool brittle and poor, condition is lost, and development stopped, though the sheep may eat and drink more than usual, their bellies are blown out and they follow the flock with difficulty, get down and scour to death. If tapeworm is suspected, and yet the segments cannot be found in the yellowish slimy dung, a lamb may be killed and their presence in the bowel demonstrated. The worms may be 10 or 12 metres long.

Several of the strongyles mentioned above, especially *Str. filicollis*, may be found in the lining of the bowel, also worms of the bloodworm type, *Sclerostomum hypostomum*, wire-like worms, 10-25mm., which bore through the bowels, as do those of the horse, so that the dung is often chocolate colored from the blood in it, and the blood points may be noticed on the lining; these nodules are sometimes called pimply gut.

Hydatids, echinococcus cysts, and water balls, *Cysticercus tenuicollis*, are common in sheep; they are intermediate forms of tapeworms in dogs, foxes, &c., and I have referred to them in detail elsewhere, and the object of these notes being to deal with worms that are adult in the sheep they may be passed over, except to point out that the water balls, which may be as big as a pigeon's egg, will certainly be found in the lower notch of the liver when lambs are affected. The practical way of stopping their spread is not to allow dogs, foxes, &c., access to offal containing the cysts.

## LUNG WORMS.

Lung worms require our attention, not only because they are so fatal to lambs, but also because there is a very intimate connection between them and stomach worms, several of the latter undergoing sexual change in the lungs before attaining maturity in the stomach, a complication that has hitherto been overlooked, and a condition which supports the utility of arsenic as a vermicide, because that drug after absorption from the bowels appears almost instantaneously in the blood circulating through the lungs in a form most easily absorbable by worms that happen to be there.

Of the eight different forms of lung worms, two are common in sheep. *Strongylus filaria*, found in the air passages, a thread-like worm 30-100mm. long; and *Str. rufescens*, 30-40mm., found deeper in the air sacs. Between them they generally set up broncho-pneumonia. The symptoms are painful and difficult breathing, a strong painful convulsive cough coming on in fits, especially when the sheep is moved, a thick abundant discharge from the nostrils in which the worms and their eggs may be found. Anaemia follows, pale skin and eyes dry, brittle wool, and in a month or two the neglected sheep is dead.

Drenching or injection into the wind pipe mean many deaths, probably more than if the animals were left alone, and the same may be said of gassing with sulphur or formalin. It is more practical to give licks as recommended and to dose with arsenic tablets; the results will be far more satisfactory. Prevention is most necessary, and a pasture fouled with the worms may remain so for a year or more; the probability is that yearly a reinfection will occur, so that liming will be found the cheapest and most practical way of cleaning such land. Lambs affected will do much better if kept off pasture till the sun is well up, and allowed a little dry feed and good clean water before going on to it.

## SHEEP FARMER OR PASTORALIST.

Owing to interchange between different parts of the State worm troubles are prevalent practically all over the farming area, and likely to spread unless the sheep farmer determines to throw aside the idea that he is a pastoralist. Sheep on the farm require constant daily attention, and no greater benefit can be given them than to arrange pasturage on a rotation. Overstocking is the main cause of the spread of worms, especially as herbage is bitten tight; practically all the worms referred to undergo development in soil or surface water, and as each female lays thousands of resistant eggs, and the females outnumber the males by hundreds, country can soon be badly infested. In older countries old pasture is known to be dangerous in this respect, and is farmed with a view of keeping it sweet and clean. It is limed, dressed, and when necessary broken up and cropped in rotation. Profitable as sheep on the farm are, and much as I desire to see their numbers increase, their presence postulates some such methods, but to cry subdivide with wire at £70 a ton or more is silly; but those of us who have to stay at home may do well to think, and those of us who come back from the old world and have seen flockmastership there will know that the ways of the pastoralist must be modified very considerably if the farmer is to make sheep pay. For one thing is certain, a

sick sheep will never pay, and if a wormy one is a danger to the rest, so the wormy ones must be checked off day by day, isolated, treated, and looked after; if it will not pay to do this take the whole lot to market and risk rust or take-all in the wheat. Worms have occupied our attention to-day, and I do not want to play the role of scaremonger; but though I have treated them as individuals for the sake of brevity and clearness, the mischief they do is frequently aggravated by the presence of other parasites, such as tick, lice, fluke, and blood cell parasites, animal parasites that break up tissues, such as sarcosporidia, coccidia, and the like. But I fear that to dilate on their activities would scare the most callous of us out of sheep-breeding, and the lesson we have to learn is that strength and constitution mean ability to fight against and destroy such tiny foes, and that neglect is to aid them against the sheep. It really becomes a matter of bookkeeping as to whether it is more profitable to be careless and breed pests, or careful and breed good sheep. Statistics show that marketable sheep have been steadily declining in numbers for years. We do not keep statistics of worms, but if we did we should find that unmarketable parasites had been just as steadily increasing.

The world wants mutton and wool, not worms and germs, and, in the words of Shakespeare—

There is a tide in the affairs of men  
Which, taken at the flood, leads on to fortune.

## TABLE GRAPES.

### FRUIT FOR THE FARM HOMESTEAD.

At the recent Conference of Mid-Northern Branches of the Agricultural Bureau, the Horticultural Instructor (Mr. George Quinn) delivered the following address:—

The reason this subject has been selected for an address is found in the fact that the grape vine is probably the most hardy fruit-bearing plant known to cultivation in climates approximating to our own. In this State over an extremely wide area favorable conditions both of soil and climate are found for the production of grapes of high quality. It is possible for this fruit to be produced almost throughout the wheat-growing areas, and a limited number of plants of selected varieties, if properly handled, would supply the homestead with this delicious and nutritious fruit through several of the most trying summer months.

Although most of the table grapes of high quality now produced on a commercial scale are grown on deep alluvial soils, rich in organic matter and perfectly drained by natural means, it does not follow that such soils are alone adapted to the purpose. Any good, deep, clay loam.



with a strong friable clay subsoil, if properly prepared, fertilized, and tilled, will yield very satisfactory results. The berries may not equal in size those grown on the alluvials, but they generally show a higher percentage of sugar—the nutritious factor in grapes.

The climatic conditions favorable to the production of good grapes are a volume of moisture equal to about 25in. of rain annually. If this falls in the shape of rain, or can be introduced into the subsoil in the late winter in the form of storm water or other good irrigation water, and retained there by means of good tillage and a proper combination of organic matter in the soil itself, the results will be better than those derived from summer rains or summer irrigations. The ideal situation for a table grape vineyard would be a warm, sunny valley, fairly exposed to winds, but exempt from late spring frosts. Given this, and the conditions of moisture outlined above, and it is possible to produce large, firm, and clean-skinned berries, rich in saccharine matter.

All land for growing grapes should be deeply moved by trenching or subsoiling, say, to a depth of 18in. to 24in. Whilst the subsoil should not be raised to the surface, or the surface soil mixed unduly with it, a good dressing of coarse bonedust or well-rotted farmyard manure mixed with the sublayers beneath each plant will show its effects for years afterwards.

The best time to plant grape vines in our climate is in the late autumn or early winter, whilst the soil is yet warm. The plants will then repair their mutilated root systems before going to rest, and be in a fit condition to replace the internal drain of reserve moisture initiated by the first outburst of leaves in the spring.

The distances apart to plant the vines will depend on the soil or the position. In open order bush vines, to be worked by hand labor, could be set 6ft. x 6ft.; but if to be tilled with implements the distance between the rows should be ample, say, not less than 10ft., whilst the plants in the rows may be still 6ft. apart for bushes, or even for some sorts when erected on to a low trellis.

#### TRAINING AND PRUNING.

I suggest that a distinction be recognised between training, which means arranging the permanent parts of the vines, and pruning, which has application to the annual shoots arising from the same.

If it were convenient in other respects, there is no doubt in my mind that well-managed gooseberry bush or goblet shaped vines yield grapes of superior quality when the variety is suited to being annually pruned to spurs of two or not more than four buds. On the other hand, where the sort will not fruit freely from buds situated so low down on the annual canes, there is little hope of dispensing with the trellis in some shape or form. It is well to distinguish here between a bulk of moderately small grapes, as represented by many bunches yielding a large volume of juice in the aggregate, and a limited number of large bunches carrying berries of uniformly large size, but rich in sugar. The former suits the winemaker, the latter the user of table grapes, and one might also say the maker of raisins.

There is not space here to elaborate the training of vines to various systems; suffice it to say the average rooted cutting, as received from the nursery, needs to be pruned back to one shoot, and that shoot, in turn, to be pruned back to one, or at most two, buds. This procedure is desirable, whether the plant in coming years is intended to be trained on a trellis or made to stand on its own stem as a bush.

In training bushes, the stem clear of branches should be not less than 10in. above the soil, and in many places 12in. do not give too great an elevation to the framework, when the need to hold the bunches of fruit out of the dirt is so essential.

#### TRELLISES.

In framing a trellised vine, the permanent height of the framework should be given by the stem, and whether the plant is allowed one permanent arm, as in the simple cordon, or two, as in the spalier or double cordon, care should be taken to train this arm or these arms to a horizontal position. This equalizes and simplifies the flow of sap to each bud or spur, and gives them a reasonably equal chance of thriving. The principle to hold in mind is that the annual shoots or fruiting wood should start each year from a common level on these arms, and so maintain an even circulation of sap. If single wire trellises are used, keep them not less than 2ft. above the soil line. If varieties needing rods to bear fruit are grown, then a three-wire trellis is recommended, the middle one to carry the horizontal arm or arms, the upper one to catch the annual growths, and avoid breaking whilst brittle, and the bottom one to be utilized as a support for the fruiting rods, which are bent down and twisted or tied around or to it. If high walls or pergolas are to be covered, use a double series of vines, *i.e.*, each alternate vine being trained to a stem, say, 2ft. long before changing or dividing it into one or two arms; the other plant is carried by a single stem to the eaves of the pergola, or half-way up the wall, before being turned to a horizontal direction. In a general sense, the vines needing to be rod pruned are very much more unsuitable for these high trellises than purely spur-pruned kinds.

When table grapes are grown on trellises or as bushes, the plants should be gone over in the early summer and all water shoots, *i.e.*, shoots arising from old wood and not needed to renew limbs or spurs, should be rubbed off. At the same time the bunches of grapes should be carefully disentangled from leaves and tendrils, and assisted to hang into clear spaces beneath. This not only makes for shapely bunches, but saves time and enables the clusters to be harvested in good condition without crushing or rubbing away the bloom from the berries. It also lessens the risks from caterpillars and mealy bugs, as well as averts the mildew or oidium, by permitting a more rapid drying off of moisture after summer showers.

#### TILLAGE.

There is no operation connected with raising table grapes demanding greater and more intelligent application than the tillage of the soil. In districts dependent upon rainfall the laud should be inverted roughly by means of a plough or fork inserted to a depth of 6in. to 8in. as soon

in the autumn as the early rains provide sufficient moisture to soften the land. This surface should be allowed to remain rough, and if weeds grow upon it as the winter progresses, so much the better. The object in opening the surface is to aerate the soil, as well as to permit the winter rain to sink into the land just where it falls upon it. In the early spring, ere the rains cease, the soil should again be turned over. This time it is merely to level back the surface and bury the weeds, so that a shallow furrow only is cut, or, if hand work be used, the land receives a skim digging only with a sharp spade. It often happens in this climate that dry days intervene at this period, and tend to harden the furrow slices very rapidly. In such instances, it is not wise to plough more than half a day ahead of breaking down the furrows with the harrows or cultivator. At any rate, as soon as possible the whole of the surface is pulverized by stirring with cultivators until a fine dry dust-like covering of soil covers the whole face of the vineyard. This is done to keep the moisture in the sublayers as long as possible. Should showers of half an inch of rain occur, or irrigations be applied, the stirring must be repeated, so as to avoid a crust forming, which will crack freely when drying, and thus facilitate the escape of the moisture into the air. These remarks apply to the broad surface of the land devoted to vines; but the tillage outlined therein must be supplemented by digging or hoeing immediately around the stems of each plant, and that more particularly upon stiff clay loams.

#### DISEASES.

The principal fungus diseases of grapes found in this State are the oidium or mildew, and the black spot or anthracnose. For the former, preventive measures, such as training the vines to allow the winds to dry the foliage readily, are desirable. Should the disease be otherwise favored by low-lying, moist positions, the dusting of the vines with flowers of sulphur applied by means of machine blowers, bellows, or open-woven bag dusters, first when the young shoots have emerged a couple of inches, and again when the flower clusters appear, or again, if the early summer season proves a humid one, always has a restraining effect if the sun heat is sufficient to vaporize the sulphur.

The anthracnose or black spot is a more difficult disease to combat effectively. The best results have been obtained by dressing the spurs and canes with a strong acidulated solution of iron sulphate about a fortnight prior to the bursting of the buds. It is claimed that spraying the newly emerged shoots in spring with Bordeaux mixture has a very helpful effect during the early part of the summer which succeeds a very wet winter.

Grapes are sometimes damaged here by mealy bugs (*Dactylopius*), which form white masses or clusters in the denser bunches, or in bunches not separated freely from the tangled foliage. This pest harbors over the winter season about the trellis posts, hiding in cracks in the timber, as well as beneath the loose dead bark of the vines themselves. By removing such bark from the stems, and whitewashing them with quicklime, much preventive work is done. As the bunches hang, the mealy bugs can be dislodged by a strong jet of water played through

the clusters. This practice also disturbs the active green caterpillars of a native *Cacoecia* moth, which are very numerous some seasons, biting off small lateral sprays of the fruit branches, and webbing them together.

#### SOIL FERTILITY.

The maintenance of a high state of fertility in the soil must be accepted as an essential in growing table grapes. Occasional dressings of good farmyard manure, ploughed or dug in at early winter, prove valuable in practically all lands. Of chemical fertilizers, bonedust or superphosphate supply phosphoric acid; potash is in normal times added as sulphate rather than as muriate of potash to fruiting vines, and the circle may be completed by the use of small dressings of nitrate of soda or ammonium sulphate. A good dressing consists of 2cwts. of bonedust or superphosphate and 1cwt. of sulphate of potash per acre, and if the super. be used instead of bonedust, then 1cwt. of nitrate or ammonia should be used. In clay soils a dressing of 3cwts. to 5cwts. of gypsum to the acre is claimed to release potash already stored therein by natural processes. In applying any of these manures, the best results arise from concentrating the dressing to a limited area around each vine, rather than spreading it broadcast over the whole area of the land.

The following is a selection of the varieties grown here, and recommended for planting to secure a succession of ripened fruits from January until April. The letters (R) or (S) following the names indicate the need for rod or spur pruning to secure good results:—

*White Grapes.*—Early—Early Green Cluster (S), Golden Chasselas (S), Quick's Early (R), Royal Muscadine (S). Medium—Sweetwater (S), Crystal (R), Trebbiano (S), Pedro Ximines (S), Buckland Sweetwater (S), Golden Champion (S). Late—Muscat Gordo Blanco (S), Waltham Cross (short R), Belas Blanco (S), Santa Paula (S), Doradillo (S).

*Red Grapes.*—Medium—Red Frontignac (S), Red Malaga (S), Red Prince (S). Wood's Red Muscat (S), Wantage (S), Lady's Finger (S).

*Black Grapes.*—Medium—Trentham Black (S), Muscat Hamburg (S), Black Hamburg (S), Black Prince (R), Ulliade (S), Madresfield Court (S). Black Mammoth (S), Grand Turk (S), Black Malaga (S).

## POULTRY NOTES FOR APRIL.

[By D. F. LAURIE, Government Poultry Expert and Lecturer.]

### AVAILABLE FOODS AND THEIR USES.

There is a need for a better understanding of the values of the various grains, seeds, mill products, and vegetable foods commonly available for feeding poultry in this State. As I pointed out many years ago, the object of feeding is to supply foods proper to each animal, so that its consumption may enable the animal to replace worn-out tissues, to carry on the life functions, and to lay up a store for emergency. In laying strains of poultry, there is little reserve stored; the balance of the food used in performing vital functions is elaborated into egg-producing substances. In the case of the table bird breeds, which, as a rule, are indifferent layers, the greater portion of the food is stored up in the tissues as meat and fat.

### WATER.

The body of an average fowl contains about 65 per cent. of water, and the water content of a normal egg is about the same. It will therefore be evident that it is of the utmost importance that a constant supply of fresh, clean water is always available. All poultry, especially laying hens, require a liberal supply of water, especially during hot weather. Although poultry have no sweat glands, and therefore do not sweat, a great deal of moisture is given off during the process of respiration. The expired air is loaded with water in the form of vapor—it is saturated, in fact.

### GREENFOOD.

Water is held in chemical and mechanical combination in all green fodders to a large extent. Picmelons are sometimes used for feeding stock, and they contain 90 per cent. and more of water. Many succulent greenfoods contain 80 per cent. to 90 per cent. It will be seen that such foods afford a very valuable source of supply of moisture.

### ROUGH ANALYSIS.

The rough analyses of most poultry foods show that the contents are proteins, which are mainly flesh-forming, and contain certain valuable minerals, such as organic sulphur; carbohydrates, such as starch, gums, &c., which are converted into heat and energy, or are stored up mainly on the liver; hydrocarbons, such as fats and oils. These fats and oils represent the most important sources of heat and energy, and are in a measure concentrated. One part of fat is equal in heat-producing value to 2½ parts of starch, &c. Many fats are valuable for their phosphorous content. Phosphoric acid combines with various other factors and is utilized in supplying the brain and nerves, and in building up the skeletal portion of the body. Minerals, such as salts, organic and other, are of the utmost importance, and hitherto they have had scant consideration. The various salts of sodium, calcium, potassium, iron,

sulphur, magnesium, &c., are concerned in the vital functions and processes. If there is a continued deficiency of these salts, marked deterioration soon sets in. The main sources of mineral salts, &c., are in greenfood and food of animal origin.

#### MONOTONOUS DIET.

Many poultry breeders seldom give the needful variety of foods, and adopt a monotonous diet, say, of wheat. No one grain, cereal, or seed, is by itself a perfect food. Each special food has its own special value, and much is to be gained by affording as much variety as is economically possible.

#### ECONOMY IN FEEDING.

Foods which may be available and cheap in one part of the State would not prove economical (except in special cases) in a part of the State distant from the source of supply. This is a point generally overlooked. For example, in the South-Eastern portions of the State oats are commonly grown, and of a superior feeding value to oats grown in the North. It would therefore not prove economical to transport fine-quality oats over such a large distance for use in the North. Owing to the special value for young stock, it will pay to use a percentage of oats during the first month or two of the chicken's life.

Again, greenfodders may be used very freely on the Murray and in other places where cost of production is cheap. Where a water supply is not available, a substitute, such as lucerne hay chaff, must be used instead.

Wheat, oats, mill by-products may be regarded in this State as the principal source of poultry food. Wheat varies in its composition, and therefore in its food value. An average sample shows a good percentage, 10 per cent. to 14 per cent., of protein, and a varying percentage of starch, rather more than is required. In both fat and mineral contents wheat is poor, and this point must be carefully noted.

Oats depend largely on their quality. Plump, heavy white oats, with thin husks, are best. Long, husky Algerians are not liked by poultry. Oats have an excellent fat content, but are low in minerals, and, of course, have a great deal of indigestible and therefore useless husk.

Barley is of more use for fattening poultry than as a grain for laying strains. Barley contains a large percentage of fibre and husk of no food value for poultry. It is low in minerals and fat. Each grain contains what may be termed specific principles, each differing widely in action. Barley-fed fowls are prone to become over-fat.

Peas are very rich in protein, averaging about 24 per cent., or nearly a quarter. The protein, however, is not easily digested, and poultry must be fed cautiously until they become accustomed to such diet. Peas are valuable in summer and winter. The fat content is low—hardly any, in fact, and the starch is lower than in cereals. Peas and all legumes have special value as poultry foods.

Maize is little grown here, and yet one day we may see it grown on the Murray lands. Maize is a peculiar grain, rich in fats and oils—a fattening food—yet peculiar in its action if long-continued use is permitted. It is valuable for use during autumn and winter, at times when there is a demand for a heat-producing food. Maize is very deficient in minerals. It should not be used in summer.

#### GREENFOOD.

Lucerne is for poultry the most economical and valuable of all crops. It may be used green, chaffed or mixed with the mash, or as a mid-day feed. Cured as hay and chaffed or milled, it is one of the most valuable foods we have. Lucerne in its green form has a good food value, and is rich in minerals. As hay chaff it is almost a concentrated food, and rich in minerals, especially lime salts.

Kail, cabbage, and rape produce a large amount of valuable green food at all times of the year. These are particularly valuable in autumn, during the moulting period, because of their sulphur content. All this family are gross feeders, and soon exhaust soil of its organic content. We see in them, especially in rape, a ready means of sweetening the soil of long-used poultry runs. There are many other sources of vegetable food, such as silver beet, carrots, beets, and mangolds, and the leafy varieties of maize. All of these are available.

#### ANIMAL FOOD.

Meat scraps, fish, and rabbits are sources of supply. The bony silver bream, numerous in parts of the Murray, may be boiled and passed through a small mill or mincer, and used, scales, bones, and all. A valuable fish meal could be made. Rabbits are plentiful in parts, and may be freely used. Animal food is absolutely essential to success in rearing ducklings. Egg production is increased by the use of animal food to laying stock.

#### MILL PRODUCTS.

Bran is valuable because it has a high protein content, and is rich in organic phosphorous compounds. It is splendid for egg-production and building up the frame. It assists in making a good mash.

Pollard is rather better than bran as a flesh former, but is too starchy for use alone, and has not the same mineral content as bran.

Bran should be scalded separately, and allowed to swell before adding the chaffed greenfood and pollard. Pollard, if scalded, becomes a gelatinous mass, as all the starch grains are converted into paste.

## THE AGRICULTURAL BUREAU.

### Conference of Mid-Northern Branches.

Farmers from widespread areas met at Wirrabara on Thursday, March 21st, when the Conference of Mid-Northern Branches of the Agricultural Bureau was held. The fixture was a popular one, and the large influx of visitors severely taxed the accommodation. Members of the local Branch met the situation in that spirit of comradeship and co-operation which characterises the Agricultural Bureau, and many of the visitors were accommodated at the homes of the Wirrabara members. The League of Loyal Women seized the opportunity, at the invitation of the Bureau, to augment their funds by supplying the delegates with lunch and tea.

### DELEGATES AND VISITORS.

In addition to some 80 or so delegates from the 33 Branches constituting the Conference district, there was a large attendance of visitors. The Department of Agriculture was represented by the Director (Professor Arthur J. Perkins), the Horticultural Instructor (Mr. Geo. Quinn), the Veterinary Lecturer (Mr. F. E. Place, B.V.Sc., M.R.C.V.S.), the Botanical Assistant (Mr. H. W. Andrew), and the Acting Secretary of the Advisory Board of Agriculture (Mr. H. J. Finnis). The delegates were:—Laura, Messrs. F. T. Hughes, H. R. Lines, W. Stevens, P. L. Bowker, E. G. Blesing; Georgetown—G. E. Hill, J. C. Myatt; Gladstone—R. E. Lines, E. T. Hollitt, A. B. Blesing, R. G. Peter; Wirrabara, G. H. Sizer, E. A. Sizer, B. C. Joppich, W. Bowman, J. Hollitt, P. R. Hoskins, W. G. Drury, A. B. and W. R. Curtis, W. Roocke, J. H. Jaeschke, W. Stephens, P. J. Curnow, A. G. Turner, C. F. H. Borgas, W. J. Barbary, T. A. Stead, T. C. Carson, W. H. Stevens, H. H. Jericho, E. P. H. Ayliffe; Redhill—W. L. Pengilly; Mount Remarkable—L. C. Mooney, A. O. McDonald; Whyte-Yarcowie—E. J. Pearce, G. F. Jenkins; Port Germein—A. P. Blesing, P. A. Colbey, H. G. Davey; A. D. Carmichael; Booleroo Centre—R. W. Stanton, G. R. Hein, M. J. Carey, F. D. Brooks; Leighton—W. H. Lloyd, A. E. McWaters, H. D. McDonald; Stone Hut—J. Bowman; Tarcowie—H. H. Edwards, W. T. Lemm, J. P. Smith; Port Pirie—F. Jose, A. M. Lawrie, J. J. Bonham; Crystal Brook—M. P. Pavy.

### THE EXHIBIT.

A feature of the Conference was the magnificent display of produce of the district, which was staged in the hall. The display was an excellent tribute alike to the productivity of the district, and the enthusiasm of the committee responsible for its collection.

The various sections were in the hands of the following gentlemen:—Vegetables and fodders—Mr. A. R. Woodlands; Fruit—Mr. P. J. Curnow; Cereals—Mr. J. Hollitt; Wool—Mr. C. F. H. Borgas; Miscellaneous—Mr. W. Bowman.



## THE OPENING.

The Chairman (Mr. A. R. Woodlands) in a graceful speech, extended a hearty welcome to the visiting delegates and officers. He called on Professor Perkins to declare the Conference open.

The Director of Agriculture (Prof. A. J. Perkins) who delivered the opening address, mentioned that it was general for Conferences of that nature to be opened by the Minister of Agriculture, or in his absence, the Chairman of the Advisory Board. Unfortunately under the circumstances prevailing at present, it was not possible for the Minister to be present. He apologised for the absence of the Minister, the Chairman of the Advisory Board, and other members.

The Director congratulated the Branch on the fine display of produce, and also on the large number of delegates that was present. The country needed at the present time the intelligent interest of all those who were engaged in production, in order that they might maintain the condition of prosperity that the country had known for many years.

They would probably have noticed that the question had been raised as to whether farmers had better give up growing wheat. Most of them would realise that was pretty nearly impossible. Wheat-growing from the point of view of the community was one of those lines of activity which they could not afford to give up. From their point of view it must have been very disheartening to have seen the condition of the stacks last year, and they could not have helped wondering whether it was worth while to grow wheat where so much of it was lost. However, the difficulties met with were the natural consequence of a state of war. Losses had occurred, and mistakes had been made, but it was easy to say after the event that certain steps should have been taken, but it was not possible for the Wheat Harvest Board to have foreseen the difficulties they had to face. He felt sure that when the final results of the Wheat Harvest Board had been ascertained the mistakes made and the losses incurred would be very much smaller than they were inclined to believe at present. He did not think it was possible to advise farmers in South Australia to even reduce the area that they were accustomed to put under wheat. He had always held, and endeavored to bring before others that it was quite possible for farmers in South Australia to produce quite as much wheat as they were at present, and at the same time interest themselves in livestock. Indeed, the more they set themselves out to do that the greater were their chances of getting a good return from wheat. They would all realize that the country was faced with a very serious position to know what to do with the wheat until it could be placed on board the ships. They probably had followed the various proposals that had been made to overcome the difficulties of the probable ravages of weevil. He felt very strongly that methods of treatment that were likely to prove effective for a short period of time only were not methods that should be adopted; they would involve us in a good deal of expense, and would have to be repeated over and over again until the wheat could be delivered.

### *Dealing with the Weevil Pest.*

He believed that there was a means of dealing with the weevil question once and for all. That method might or might not appeal to them, according to their preconceptions.

It was a method that had been adopted in other countries under similar circumstances. Those who knew Bible history would recollect that at a time when famine was threatening in Egypt, a very far-seeing man stored up wheat for seven years. The question was how was it done? It was done in a way that was still being adopted all around the Mediterranean, particularly on the Northern African coast. The wheat was simply stored away in underground silos, that were hermetically sealed, and given that the wheat was put in sufficiently dry, it would remain there unchanged until it was required. He recognised the difficulties that such a scheme raised, namely, if silos were to be erected to meet our present difficulties, they would be more or less valueless in normal times. But there was a way out, and one that would solve not only the wheat question, but which would be of great assistance to them as farmers, if they were prepared more thoroughly to interest themselves in livestock. If silos had to be built, they might as well be placed in a position where they were likely to be of use later on. Secondly they should be of such a type as could be put to useful purpose in future years.

He had always held that when farmers took up livestock they were inclined to follow station practice, and to allow their livestock to pick up their living according as to whether seasons were favorable or unfavorable. That was not the way in which livestock should be handled on farms. They must make adequate provision to feed their livestock on produce raised on the farm, bearing in mind that livestock farming consisted in transforming into flesh, milk, wool, or power the produce of the farm.

There were various ways of storing their produce and handling it. Hay was an example, but it was unsatisfactory, as most of them had experienced, if they stored it for too long a period. Another method that was good, not only for milch cows, but for all sorts of livestock, was ensilage. They had been often advised to erect silos and store ensilage, and they had not done it, no doubt on account partly of the expense, and partly because there was a prejudice against it.

### *Storing Wheat in Silos.*

Coming back to the wheat proposals, he said, if the wheat had to be stored in silos, why should it not be stored on the farm itself? Assuming that the authorities were prepared to help towards the cost, it could be done. Taking as an example the man who had 3,000 bags of wheat, he said, that meant that he had 9,000 bush. of wheat to store. The capacity necessary to store that quantity would be about 11,500 cub. ft. A silo of that capacity would supply space sufficient to store about 180 to 200 tons of ensilage. The ensilage pits at Roseworthy Agricultural College were, roughly, about that capacity, and for years they milked on an average from 20 to 25 cows, and never had ensilage to spare for other livestock. The ensilage pits

were generally not opened until January, and the ensilage lasted the dairy herd well up into the winter, and by the time the ensilage was finished there was generally an abundance of grass available to them. Assuming that they would admit that ensilage was of value, that they were going to handle livestock, it would pay the State to help to put up ensilage capacity to that extent. At the present time material was expensive, but they could put up a reinforced concrete structure of that capacity approximately at 20s. to 30s. per ton. The 200 tons of ensilage would cost £200 to £300 in the way of silos and the silo would store about 9,000 bush. of wheat. Even if they had the space for 400 tons of ensilage, they could use it on a farm of that size. That seemed to him a reasonable proposition. He felt that sooner or later they would have to handle the wheat crop generally in bulk, and ship it away in bulk. The experience that they would gain by handling their grain in that manner, he suggested, would be of service when that time came. Of course, he took it that grain stored in silos on the farm, would belong to the Government, but the silos would belong to the farmers.

He suggested the foregoing as a scheme worthy of their consideration. It appealed to him chiefly because he thought it would compel many farmers to handle livestock.

The Director then expressed the hope that the Conference would be successful, that the subjects discussed would be of interest, and that they would return to their farms strengthened and determined to do their best for themselves and their country.

#### BLACK SPOT IN VINES.

Mr. P. J. Curnow (Wirrabara) then contributed the following paper:—"During the past two seasons this district, in common with other parts of the State, has suffered from a visit of the anthracnose, or black spot fungus, in vines. Some 25 years ago a similar outbreak occurred, and did a good deal of damage, although vine-growing then was only on a limited scale. In the absence of definite knowledge as to treatment growers attempted no remedial measures, and after one or two seasons all varieties of vines fully recovered. With the exception of an odd year, when oidium appeared, vines in this locality have suffered from no disease of a serious character since then. The 1916 spring, after a rainfall for the year of 39 odd inches soon produced evidence after vines started into growth that a fungus disease was at work in the plants. Sultanas made a vigorous start, but by November new growth began to wilt, and later on even long shoots showed signs of dying back, and leaves began to fall. No flowers were produced, the fungus having destroyed the flower buds. From that time until autumn the disease made rapid headway, and by the fall most affected plants were defoliated, and looked as though a fire had been through them. Sultanas, Waltham Cross, and to a lesser extent many common sorts, were affected. Zante currants practically escaped. In an excellent article appearing in the April *Journal of Agriculture*, Mr. H. E. Laffer, late Viticultural Expert,

dealt with the anthracnose outbreak. He dealt with the life history of the fungus, and made certain recommendations for treatment. The writer held to the conviction that winter treatment was the principal method of eradication. On Mr. Laffer's recommendation, the present writer treated his vines with this formula—50lbs. sulphate iron, half gallon commercial sulphuric acid, and 10 gallons of water. Dissolve sulphate after adding the acid to, say, 4 gallons of boiling water. When still warm apply. Here a difficulty occurs, as the iron sulphate will corrode all metal but lead-lined pumps. The liquid has to be swabbed on to every part of affected vine with a cloth. No portion must be missed. This method wastes about two-thirds of the remedy. If a proper pump could be used the whole process would be simplified and much liquid saved. The proper time to treat vines is a fortnight before the buds begin to move. If the buds have already started the application of the remedy will certainly kill them. Some sultanas were not treated, and were badly affected again this season. Last spring the treated vines made an excellent start, but soon showed that treatment had not been wholly successful. Growth several feet long was made, but soon showed signs of the disease. No fruit was produced this season, and at time of writing the plants are again badly affected, although not so seriously damaged as those not treated. The rainfall last year was a little over 36in. Some sultanas grown on fairly high ground in another locality a half mile from the affected area had no disease, and produced excellent fruit last year, and are clean again this year, although the crop was very light. Curiously, in 1910, when close on 45in. of rain was registered in the same district, there was no black spot. After only one year's experience in the treatment of the disease the writer is at a loss how to proceed to secure a more definite result. With the object of securing the latest information in relation to the best methods of combating disease the following questions are submitted for the consideration of the visiting experts and experienced delegates:—

"Is any method of summer treatment advisable? Will sulphuric acid alone check the disease? As hardware merchants in this State, the writer understands, do not import a suitable lead-lined pump, could not the Department of Agriculture make inquiries in a vine-growing country like France, with the object of securing information and prices of a suitable implement? No doubt if such information were placed before a leading importing firm supplies may be procurable by next season and growers materially assisted in this way."

#### TABLE GRAPES.

The Horticultural Instructor (Mr. George Quinn) addressed the Conference on the culture of varieties of grapes suitable for table purposes. He exhibited specimens of different varieties which were capable of providing a succession of fruit throughout the season. A number of questions were subsequently put to the lecturer, and answered to the satisfaction of the audience.

### Afternoon Session.

#### THE BOY ON THE FARM.

The initial item of the afternoon session was the following paper by Mr. W. J. Barbary (Wirrabara):—

"I have observed that subscribers of papers to the Wirrabara Branch have followed an excellent rule, viz., that the paper be well-chosen, short, but very suggestive. The result is that much useful information is distributed by means of discussion rather than handed out directly from the content matter of the paper itself.

"Millions of young men to-day are being spent at the war, and when this great tragedy is over, we shall be short of men. Therefore, it is of paramount importance that we do our best towards efficiency in our boys, who must, in the near future, carry on the world's affairs short handed. Even that unfortunate farmer whose interests rarely extend beyond his own paddocks sets a high value on his son, who will some day work a team for him. Bigger men know that the true worth of a boy now, more than ever before, is incalculable.

"Since I became of age I have continuously taught boys in large and small schools, and I should know something of the mind and body of a boy. Besides, I was a boy myself not long since, and I can see now that many—yes, most—of my difficulties then were caused by the failure of grown-ups to understand, or even make an attempt to understand, my point of view. Talk things over with your boy, and let him tell you what he thinks, and when reasoning fails—which will not be often—then use authority. The less you *make* him do things, the better, for the time is coming soon when you can no longer command. He will then choose for himself, and will be well equipped for that responsibility if his parents have trained him so to do. But if, on the other hand, he has been that good little boy who did just what he was told and no more, he will break away suddenly, and without the necessary habit of choosing right and averting wrong. Everybody remembers that *tame* boy who grew into a wild, undesirable man.

"Before I was 13 years of age, I had the misfortune to work for two wheatfarmers and one dairyman. If my hearers desire to know why I use that word 'misfortune,' I am prepared to recount orally a few of my experiences in those days, if called upon to do so later on.

"There are two boys who work on your farm—one is your son, and the other is somebody else's son, and merely works for you. Let us first treat of the farmer's son, and we cannot study his good too early.

"As a baby, do not pick him up and nurse him because he is crying, but rather put him down when he cries, and think whether he is properly fed and comfortable. Follow this rule—nurse him only when he is good, and leave him when he cries, if you are sure his physical wants are satisfied, and as sure as night follows day, he will very seldom cry. Let him crow for lung exercise instead of howl, and let him kick and buck to prepare for sleep rather than have the contents of his little stomach rocked and rolled about like cream in a butter churn. He will take all the hundred-and-one exercises that he needs without your help, and, what is more, he will begin them and end them at the proper time, and that is more than you can do for him.

"Send him along to school at five if he is a normal child." He may not get through the final grade earlier, but he certainly will go through all the grades more easily and better. His nine years of school life will be ever so much happier, because he is quite ready each year for harder work. I always feel very sorry for the child who just passes each year. He has a hard, unhappy struggle for those nine years out of his first 14.

"Send him regularly, for nothing tends to spoil a boy like the missing of lessons. He begins to excuse himself, thinks his teacher should overlook his errors, because he was absent, and generally gets farther and farther behind, to say nothing of his loss of happiness, pride, and self-respect. Do not have him up early doing work before school, and home early for jobs galore before tea. Almost without exception, the child who has much regular work at home is unhappy at school. The authorities who plan out the amount of work at school reckon that when that is done the child may play. Play is the child's proper work, it is the work appointed to him by Nature—let the parent spare to him what the schoolmaster has not filched away. And Saturday free is his birthright—free to work or play according to his boy's nature.

Now he is through the primary school, what shall we do with him? I would say, if possible, send him along to a high school or a technical school, such as the Adelaide School of Mines or Roseworthy Agricultural College. And this for three good reasons:—First, to get learning, both mental and manual; second, to receive training or discipline; third, to link up his life to those of lads going into various trades and professions, and to make him fit comfortably among strangers.

"With regard to knowledge, all learning is light to carry and enriches life without weakening the muscles. As to training and discipline—this is the *half* of education which is rarely thought of by the average man. The lad who has worked his way into the secrets of Euclid, Algebra, chemistry, and physics, as well as literature and history, and so forth, has done something for his brain. He has exercised it, and developed it, and will be able to think his way out of new difficulties because the muscles, as it were, of his brain are strong. The Algebra and geometry, the Latin or the Greek may soon appear to be useless, and in a direct sense they may be almost so; but the brain power acquired by exercises in them will never go. That's the discipline and training that makes for modesty and quiet strength. Knowledge is good, but it is only half an education, and the poorer half at that. I agree with Tennyson—

Who loves not knowledge? Who shall rail  
Against her beauty? May she mix  
With men and prosper! Who shall fix  
Her pillars? Let her works prevail.

But on her forehead sits a fire:  
She sets her forward countenance  
And leaps into the future chance,  
Submitting all things to desire.

Half-grown as yet, a child, and vain—  
 She cannot fight the fear of death.  
 What is she, cut from love and faith,  
 But some wild Pallas from the brain  
 Of Demons? Fiery-hot to burst  
 All barriers in her onward race  
 For power. Let her know her place,  
 She is the second, not the first.  
 A higher hand must make her mild,  
 If all be not in vain; and guide  
 Her footsteps, moving side by side  
 With wisdom, like the younger child.  
 For she is earthly of the mind,  
 But wisdom heavenly of the soul.  
 Oh, friend who camest to thy goal  
 So early, leaving me behind,  
 I would the great world grew like thee,  
 Who grewest not alone in power  
 And knowledge, but from hour to hour  
 In reverence and in charity.

And now we are come to the third reason for a higher education. It is hard to estimate the value to him of associations formed at college. The boys he knew there will soon be scattered about the Commonwealth, some occupying very high positions in various walks of life. He is interested in them, and they in him. He compares himself with bigger men than himself, and arrives where? At—

Humility, that low, sweet root,  
 From which all heavenly virtues shoot.

How many farmers do we see who are yokels, not from lack of brains, but from want of experience with men.

"When he leaves school behind, use every endeavor to induce in him a feeling of partnership in the farm. How can we do this? Give him a mare and start him out to breed a team for himself. Ownership is a wonderful incentive. Let him have a field on shares, or so many bags from each hundred, or some such tangible interest. Be liberal with pocket money, discourage foolish spending, eye with pleasure the growth of his bank balance. If possible, give him a bedroom for himself, so that he may collect just what his hobby dictates. He should have his shelf of books, and his walls may be littered with cuttings from the weekly papers. His sisters and mother will probably growl, but the boy is right. Give him his own table, with ink and paper handy.

"Discuss your plans freely with him, and ask him his opinion always, and follow it sometimes, even when your own is slightly different. I regard this as of the utmost importance, that you habitually confer with him, and thus give his power of initiative an opportunity to develop. Initiative can only be acquired by venturing, and it is an attribute worth the cost of very many mistakes.

"We should watch our boy's physical development. To overwork a boy is a crime. The youth whose feet are as big as his father's, and look bigger because his pants are too short one end, requires careful handling. Bone and muscle are such expensive things to build that a youth is in reality not nearly the man he wishes to be and sometimes

fancies he is. His gameness at this particular time of life often leads to permanent injury. In after years he is not the man he could have been. What farmer here does not know the folly of overworking a colt? How much more, then, is a youth than a horse?

“As a boy he thought his father was different from all other men, but from 16 to 20 he discovers that that was wrong. He tries to think like a man, does not question his own conclusions, and in some cases his impatience with others is a constant exercise in patience for them. However, he will soon get accustomed to thinking things out for himself, his judgments will be less severe, and then you have the *man*.”

“And, lastly, we come to the other man's son, who is working for you. Try and see things from his point of view, and he will work all the better. As a rule, he is a poor boy, and may be a poor sort of boy, so treat him like your own son as far as is humanly possible. Train him to be resourceful and self-respecting, for he is not getting a very good start in life. Above all, bear in mind that he will some day be a man. He may be contented now, and from inexperience he may think you are a good fellow. Do not be deceived by this, but in all your dealings with him ask yourself, ‘What will he think of this when he is 30?’”

#### VETERINARY DEMONSTRATION.

The Veterinary Lecturer (Mr. F. E. Place, B.V.Sc., M.R.C.V.S.) demonstrated the treatment for a foal suffering from “umbilical hernia” by means of reducing the bowels and ligating the dependent skin. With the assistance of Mr. George Hill, three cases of cancerous growth affecting the eyelids or eyeballs were removed under the influence of cocaine, eucaine, and hemisene. The case of a staked wound in the breast was dealt with, also one of a muscle tumor of the arm complicated by a varicose vein. A cow suffering from a cutaneous form of tuberculosis, also several cases of lameness and the causes were pointed out, namely, splints, side and ring bones, and spavins, after which a horse suffering from a cancerous growth of the head was destroyed, the head sectioned, and the growth removed from the facial sinus, which proved to be a carcinoma. It was regrettable that of the 15 cases treated, none of the animals belonged to members of the Agricultural Bureau.

#### FREE PARLIAMENT.

At the instance of the Tarcoowie Branch consideration was given to the question of the advisability or otherwise of using lime in that district. The Director of Agriculture (Professor Perkins) said that in a general way, if they took the great bulk of the South Australian soils within the agricultural area, it could not be said that, as a whole, they needed lime, but there were parts of the country on which lime would be of value. That type of country, so far as he was aware, lay more to the south-east of Adelaide, and in the hills. It was comparatively rare to find a dry district in which the land was deficient in lime. Lime was absolutely essential to plant growth, and to the upbuilding of livestock. In the absence of that constituent, not only would they have deficient vegetation, but stunted animals. Sometimes it was assumed that land needed lime because there were no deposits of limestone in the district. That did not follow, because many soils were not formed



locally, but from material that was carried over great distances. A general reply to a question of that sort, he said, would be that before they could determine that absolutely, they would need to have the soil examined.

Mr. R. E. Lines (Gladstone) mentioned that some of the plots in the district were extremely stiff, to which Professor Perkins replied that a dressing of lime would have the effect of rendering the soil more open.

The Horticultural Instructor (Mr. Quinn) discussed the general question of the application of manures to grape vines.

#### Evening Session.

In the evening the Botanical Assistant (Mr. H. W. Andrew), who had prepared and exhibited at the Conference a number of specimens of weeds, delivered a short address dealing with the seed inspection work of the Department. After explaining the principal objects of seed testing, particularly in so far as it contained the control of weeds, Mr. Andrew stated that during the past four or five years they had sampled all consignments of seed imported from abroad, including New Zealand, on arrival at Port Adelaide or the Outer Harbor. If the seed contained weed seeds new to the State, or other weeds in large quantities, they were put through the Commonwealth grading machine, and if a satisfactory job could be made of it, the goods were then released. If they could not be satisfactorily cleaned, they were returned to the country of origin or destroyed. Large quantities of bird seed were imported, over or from the Mediterranean region, and very many consignments were found to contain seeds of some of our commonest weeds, such as Salvation Jane, Naney, drake, cockspur, and turnip weed, and there could be but little doubt that some of those had been largely distributed by way of bird seed. On the other hand, probably dirty agricultural seed had given the State a far greater number of different kinds of agricultural weeds than any other.

Although considerable powers existed under the Commonwealth laws in respect to dirty seed from abroad, there was, he said, unfortunately no power so far to deal with dirty seed coming from the other States, and as there were a large number of weeds in the adjoining States which had not yet reached South Australia, there was considerable danger of importing them through these channels.

Mr. Andrew then dealt with the groups of weeds as represented by specimens exhibited, drawing particular attention to some perennial weeds, such as the field bindweed, hoary cress, and certain new weeds like burr grass or hedgehog, hitherto found in one locality of the State only.

An address was then delivered by the Director of Agriculture on the cultivation of lucerne.

After it had been decided that the next Conference was to be held at Booleroo Centre, an adjournment was made to an adjoining hall, where the visitors were the guests of the members of the local Branch. A lengthy toast-list was honored.

### Conference at Yeelanna.

Representatives from the 12 Branches of the Agricultural Bureau situated in the Lower Eyre's Peninsula met in Conference at Yeelanna on Monday, March 25th. The delegates who attended were:—Cummins—Messrs. W. A. Trigg, S. Trigg, G. H. Potter, J. Durdin, A. Fuss; W. Blueher, W. A. Hockley, I. Roe, W. Beisel, R. H. Siviore; Green Patch—J. W. Winch, R. L. C. Sinclair, E. E. Chapman; Mitchell—A. Ashman, E. E. Jenkins; Mount Hope—F. Myers, G. A. Vigar; Butler—G. J. Parker, R. W. Phillis, C. F. Jericho, J. Owen; Koppio—W. R. Richardson, T. R. Gardner, J. Newell; Edillilie—A. Palm, M. A. Palm; Yeelanna—G. C. Smith, H. Glover, T. H. Proctor, J. A. Dunn, W. Habner, W. L. Williams, S. A. Wilkin, J. K. Dunn, R. C. B. Smith, J. J. Williams, W. D. Wemyss, Jim Cronin, H. G. Dennis, J. Cronin, A. E. Skipworth, W. Williams. The Department of Agriculture was represented by Mr. P. H. Suter (Dairy Expert), Mr. W. J. Spafford (Superintendent Experimental Work), and H. J. Finnis (Acting Secretary Advisory Board).

### THE OPENING.

The chair was occupied by Mr. G. W. Proctor, who extended a hearty welcome to the delegates and visiting officers.

In declaring the Conference open, Mr. H. J. Finnis referred to the progress that the Agricultural Bureau had made during the past few years. Despite the depressing effect of the war, and the large number of members of the Bureau who had enlisted, the membership of the institution had been more than maintained, and the number of Branches inaugurated since the beginning of the war was 45. He expressed pleasure at the good attendance, which was an indication of the interest which farmers in the outlying districts took in the Bureau.

### DAIRYING ON EYRE'S PENINSULA.

This subject was dealt with in the following paper by Mr. G. A. Vigar, of the Mount Hope Branch:—

"I desire to place this subject before you, as I believe dairying should be practised on Eyre's Peninsula as a side line to wheat growing, at the same time viewing the general conditions prevailing throughout the mallee hundreds at the present time, where many blocks are being abandoned because they cannot be worked profitably by wheat growing only. There has been an effort lately to secure Government assistance in obtaining sheep to stock such farms as are capable of carrying stock. I believe the settlers would be better off if they turned their attention to working up a dairy herd. No doubt, in some cases the sheep may be preferable, but generally, under existing conditions, the cow would be more profitable to the settler than the sheep, for the following reasons:—The sheep at best only gives two returns per year—the wool and the surplus stock; the cow, on the other hand, is giving a continual income, week after week, in the butter returns, and then there is also the surplus stock. For the country I have under review I would not suggest any special breed. It is more a matter of working up a herd from the cows we have than of going in for any special breed while the

price of cows remain so high. But, at the same time, we should secure the services of the best bull procurable. Every blockholder should keep at least six milking cows. He and a lad can attend to these, and still put in 200 acres of crop per year, and he will find that if he looks after his cows as well as he does after his horses, the cows will more than pay his store bills. The question of fodder growing is so closely connected with dairying in the mallee districts that it is useless keeping cows if an effort is not made to grow fodder for them, and I contend that on every farm that has 200 acres of crop, there should be sufficient stable manure to manure 5 acres of land for the growing of garden stuff for the cows, also some well-drained position, where the garden can be placed, so that it can be worked almost any time. The crops that I would advise sowing are:—For the first sowing, for winter (use manure as heavily as possible on about 1 acre of land), about 1½ bush. of rye. This will grow through the cold winter weather, and should be fit to cut early in July. It makes a coarse feed, but cows eat it readily during the winter. The next acre I would sow to Cape barley in well-manured land. By the time the rye is finished, the barley should be ready to cut. The next acre I would sow to some early-maturing wheat. If this is not needed for the cows, it can be cut for hay. The remaining 2 acres I would sow to King kale. This will be ready for use immediately after the first rains, and it is surprising the quantity of feed that can be got from King kale. After the cut of rye has been taken, this piece of ground should be again manured, and sown with long red mangolds, and if well worked they will give excellent returns. The piece sown to barley should be fallowed up for the rye crop the following year.

"The cows should be well attended, and milked and fed twice a day. Just as much attention should be given to the feeding of the cows as to the horses. It is only necessary to separate the milk once a day. The evening milk can be strained in a pan and warmed up in the morning to be mixed with the morning's milk, and put through the separator, and a good skim will follow. Always endeavor to get about a 50 per cent. cream—that is, cream that will yield 1lb. of butter from 2lbs. of cream. The butter factories like this percentage. Never mix the freshly separated cream with the other cream until it is quite cold. It is best to let it stand until the next day before mixing it. Send the cream to the factory at least once a week. When a man is milking six cows he should have a regular income of at least 30s. per week, and there is but little outlay apart from his own labor. It will take a man and a boy about two hours out of the day to attend to six cows. I do not think the wheat crop will give better returns for the time and capital put into it than the cows."

#### *Other Opinions.*

An interesting discussion followed the reading of the paper. Mr. G. H. Potter began, and Mr. J. W. Winch followed with an expression of his views.

Mr. A. Palm mentioned that it was important that attention should be given to fodder-growing before they were in a position to adopt dairying.

Mr. W. H. Trigg (Cummins) urged the importance of careful consideration before embarking on dairying. Only good animals should be procured. The idea of growing fodder should be put into practice, and it should be cut and fed, rather than grazed, which was wasteful. He also urged that the cows should be carefully tested; that would enable them to find out which were profitable. He thought there would be more profit in dairying than they were likely to secure from wheat.

Mr. G. J. Parker (Butler) thought most farmers would be well advised to keep cows. It was best to send rather thin cream to the factory. He preferred a cream of a consistency of 50 per cent. At the same time, in the summer it would be of advantage to have it a little thicker. On the question of food, he said that however good the animal, it was impossible for her to do herself justice unless properly fed. The growth of rye, cereals, roots, &c., was a good practice. It would not be wise to graze the plots, but with bigger areas of cereals they could feed off.

#### *The Dairy Expert's Opinion.*

Mr. Suter expressed pleasure at the fact that the farmers were beginning to turn their attention to dairying. He complimented the writer of the paper, and the men who had engaged in the discussion. The question had been raised as to whether in the cool months of the year it was necessary to separate twice daily. All that was necessary was to handle the milk in a cleanly way, and separate in the morning or evening, as they preferred.

The Dairy Expert then dealt at length with the dairying industry, expressing the view that there was no branch of agriculture that was so profitable. Land that was worth up to £120 per acre was being used for dairying; but it must be recognised that if intending dairy-men were to make a success of the venture, it would be necessary for them to adopt more up-to-date methods than were general in this State. The question of feeding was of the utmost importance, and it was necessary for them to have some idea of the feeding values of different fodders. The lecturer then directed attention to the need for herd testing, and mentioned, by way of illustrating its value, the results of tests of two South Australian herds, which indicated a marked divergence in the quantity of milk produced by individual cows. The necessity for securing the services of sires with a record of satisfactory performances was also urged. At the conclusion of his address, Mr. Suter answered a number of questions.

*(To be continued.)*

## ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, March 13th, 1918. There were present Messrs. Geo. Jeffrey (chair), C. J. Tuckwell, T. H. Williams (Chief Inspector of Stock), W. J. Colebatch (Principal Roseworthy Agricultural College), J. Miller, F. Coleman, A. W. Shillabeer, A. M. Dawkins, and H. J. Finnis (Acting Secretary).

### ALTERATIONS OF FERTILIZER ACTS.

An intimation was received from the Hon. the Minister to the effect that steps would be taken to strengthen the Fertilizer Acts in the direction suggested by the Director of Agriculture in his Annual Report of 1917. (The suggested alterations have been published on page 650 of the March issue.)

### CONFERENCE OF DAIRY FACTORIES.

In June, 1917, a conference of dairy factories was held under the auspices of the Board. At that conference a resolution was carried requesting the Government to make the conference an annual affair. Approval was sought from the Minister of Agriculture for the necessary expenditure. The Minister had intimated, however, that in view of the financial position the expenditure could not be approved. The Board decided to ascertain from the Minister whether, in the event of delegates to the conference being willing to share the expenses, he would be prepared to reconsider his decision.

### STANDARD FOR AUSTRALIAN-MADE CORNSACKS.

In May, 1917, prompted by a complaint from the Butler Branch of the Agricultural Bureau to the effect that locally-made cornsacks were inferior to those imported, the Board recommended that Australian-made cornsacks should be required to conform in size and quality to the standard imposed on imported sacks. With a view to securing joint action throughout Australia, other States were communicated with. A communication had been received from the Premier of New South Wales pointing out that so far as that State was concerned there were some cornsacks made there which conformed very nearly to the standard wheat bag in size, but were much inferior in quality. They were, however, seldom used by farmers for wheat, oats, &c., and no reports had been received by the State Wheat Office that sacks other than standard size were being used. It would appear that, to prohibit the sale or use of the sacks referred to, special legislation would be necessary; but in view of the small number involved, that did not appear to be justified. If it were decided to have uniformity in size and quality it should be a condition that such cornsacks should be of what was known as "eight porter nine shot quality." It was desired to know under the circumstances whether further procedure in the matter was deemed necessary. After careful consideration the Board came to the conclusion that it was desirable that legislative

provision should be made that no Australian-made sacks should be sold as cornsacks unless they conformed in both size and quality to the standard Chapman sack.

#### LIFE MEMBERS.

The names of the following gentlemen were added to the list of life members of the Agricultural Bureau:—Messrs. R. Thompson, C. Patten, Quorn Branch; J. Hillier, A. M. Dawkins, Gawler River Branch.

#### NEW MEMBERS.

The undermentioned names were added to the list of members of existing Branches:—Meadows—S. G. Mawson; Pomppoota—Weir, Hills, Read, Myers, Myers, jun., McClushey, Wright, Flett, Brown, McCloud, Denman, Thomas, Watson, Colton, Vogan, Robertson, A. Crayford, H. Colton; Ashbourne—M. G. Rogers, Alf. Rogers, Marshall, F. Allinghame, G. Allinghame, W. Haines; Yaninee—W. Parsons, P. Ryan; Ramco—Wm. Hartwig, C. Christiansen, M. Robertson, H. Hunter; Meribah—L. Shannon, John Tee; Mount Barker—A. Pengel; Lone Pine—O. Minge, R. Braunack, B. Nitschke; Milang—W. G. Gosden, E. Williams, E. G. Mills; Blackwood—W. Gamble; Dowlingville—C. Phelps; Tatiara—A. H. C. Guy; Morehard—H. B. Koch, C. Andrews; Whyte-Yarcowie—S. Hunt; Mount Gambier—J. Duell; Mount Remarkable—A. Appleton, A. Arblaster, H. W. Brown, G. C. E. Bowes, H. Cocks, B. J. M. Cocking, F. Dunn, C. Francis, A. Ferguson, F. A. Gillen, W. Gambic, L. H. Hoffmann, W. Johnston, A. W. Knapman, J. M. Kurnot, F. T. Miller, A. O. McDonald, C. W. Martin, H. L. Morgan, A. W. C. Nelson, G. Piercy, A. C. R. Snee, R. C. Slater, W. A. Taylor, J. C. Telford, R. G. Uppill, J. Whitford, A. G. Winter; Monarto South—E. Bormann.

#### VERMIN AND POISONED WHEAT.

"We understand it makes all the difference to the success of poisoned wheat which variety of wheat is used, as vermin have a preference for some particular wheats, and, also, some varieties take the poison better," writes a correspondent. The preference birds show for certain varieties of wheats rests wholly on the size of the grains, in the opinion of the Superintendent of Experiments (Mr. W. J. Spafford), and it will generally be found that they will eat the small-grained wheats more readily than the larger ones. The animal pests that have to chew the grain appear to prefer the softer wheats to the harder ones. The hard, glassy wheats, because of their flinty nature, do not absorb moisture as quickly as the softer floury-looking wheats, and so very possibly these soft wheats will "take" the poison better than will the others. To get the best results with poisoned wheat, it is advisable to use a variety with small and soft grains.

## DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Ltd., report on April 2nd:—

**BUTTER.**—A further shrinkage in supplies has been noticeable, and the absence of rain is causing dairy folk to be somewhat anxious. However, it is still early, and a good downfall of rain would ensure a favorable season. Heavy quantities of imported butter continue to come forward from the Eastern States to fill up the shortage. At the close of the month "Alfa" sold at 1s. 7d.; "Primus," 1s. 6½d.; second grade creamery, 1s. 3d.; third grade, 1s. 2d.; choice separators and dairies, 1s. 4d. to 1s. 5d.; fair quality, 1s. 2d. to 1s. 3d.; store and collectors', 1s. to 1s. 2d. per lb.

**EGGS.**—Throughout the month these have shown fluctuations, and the advance in price has caused holders of pickled and refrigerated lots to place consignments on the market. Fresh hen eggs, 1s.; duck, 1s. 1d. per dozen.

**CHEESE.**—Owing to some of the South-Eastern factories making the 40-lb. size for the Imperial Government, stocks are light; market at moment being bare. Prices are right up to proclaimed rates, viz., matured, 10½d. to 11d.; new make, 9d. to 9½d. per lb.

**HONEY.**—Increasing quantities are coming forward, but the active demand is readily clearing all offering, prime clear extracted selling at 4½d. to 5d. per lb.; second grades, slow of sale at 3d. to 3½d.; beeswax, in good request at 2s. per lb.

**ALMONDS.**—This line has further improved, export buyers advancing their prices to obtain supplies. Brandis, 1s. 3½d.; mixed softshells, 1s. 2½d.; hardshells, 9d.; kernels, 2s. per lb.

**BACON.**—Curers have had a very busy time, heavy quantities of the live animal being available; but it is pleasing to report that the interstate and local demand has readily cleared all offering. Best factory-cured sides, 11½d. to 1s.; hams, 1s. 1d. to 1s. 2d. There is still no sale for farm-cured lots.

**LIVE POULTRY.**—The forwardings have been quite up to the usual Easter quantities, most of the markets being well supplied. Demand throughout has been exceptionally good, and very fair prices have been realised for birds fit for table purposes. Heavy-weight table roosters sold at from 3s. 3d. to 4s. 6d. each; nice conditioned cockerels, 2s. 6d. to 3s. 2d.; plump hens, 2s. to 3s. 4d.; light birds, 1s. 9d. to 2s.; ducks, 1s. 9d. to 3s. 4d.; geese, 3s. 9d. to 4s. 6d.; pigeons, 6d. each; turkeys, from 8d. to 1s. 1½d. per lb. live weight for medium to prime table birds.

**POTATOES AND ONIONS.**—Deliveries of potatoes in the Mount Gambier district have been little more than sufficient to furnish the requirements of country buyers, and the Adelaide market has been supplied chiefly from the Warrnambool and Gippsland districts of Victoria. **Onions.**—Locally grown supplies have cut off completely, with the result that local buyers have had to depend entirely on the Mount Gambier district and Victoria. **Quotations.**—Potatoes, £5 10s. to £7 per ton, according to variety, on rails Mile End or Port Adelaide; onions, £8 10s. to £9 per ton on rails Mile End or Port Adelaide.

## THE AGRICULTURAL OUTLOOK.

### REPORTS FOR THE MONTH OF MARCH.

The following reports on the general agricultural condition and outlook of the areas represented by the Government Experimental Farms mentioned below have been prepared by the respective managers:—

*Boonborowie.*—Weather—With the exception of a thunder-storm on March 5th, when 62 points of rain fell, this month has been fine and dry, the days have been hot, but cool nights and dewy mornings have been frequent. Crops—The lucerne crops on the flat have made good growth during the month. Natural feed—Dry grass is still plentiful, but the sheep have not kept their condition as well as was expected, the feed this year not being as good as usual. Pests—A few grass-hoppers are about; these are hatching from eggs left by the previous swarms.

*Kybybolite.*—Weather continues to be exceedingly dry, the early part of the month was rather cooler than usually experienced at this time of the year, the nights being quite cold, but the latter portion has seen a revival of hot conditions. Crops—Summer crops have finished early on account of the very dry summer season. Some seeding of oats has been accomplished, this will be utilised for green feed. Very little ploughing will be done before rain falls. Natural feed is plentiful in most instances, but absolutely dry and of poor quality. Stock dependent on natural pastures are in many instances going off badly, and serious losses have occurred with sheep. Stock vary greatly in condition, from very poor to fairly good order. Sheep are generally poor, and heavy stock better. Pests are plentiful, and various local bodies are taking action for dealing with them before the lambing season commences. Miscellaneous—The apple crops are good in quantity and quality, and picking and packing are now in full swing.

*Minnipa.*—Weather has been fine, dry, and comparatively warm. Except for 40 points early in the month, practically no rain has fallen. For the three months just ending less than 1 in. of rain has been registered, hence farmers are expecting another good supply during the coming wheat-growing period. Fires have been numerous during the month, and many good burns have been recorded. Quite a number of fires got without bounds, but, excepting for some fencing, little damage was done. Some farmers have commenced ploughing their new land. Natural feed—Very dry, but plentiful. Pests—The poison cart has been working continuously during the whole of the month, and very good results have been secured.

*Turretfield.*—The first half of the month was cool, but only 44 points of rain were registered. During the latter half, the weather was warm to hot. Crops—Lucerne crops that are not watered from the Barossa reservoir and are dependent on the water from the North Para River for irrigation, are beginning to show signs of the continued dry weather. The water in the river is at present too heavily charged with salts to be suitable for irrigation purposes. Grape-picking has been practically finished, and growers appear satisfied with the returns obtained. Natural feed is gradually giving out, and where hand feeding is not practised stock are falling off in condition. Stock are all in good health, but more attention has now to be given to hand feeding. A few lambs have been noticed in the district. Farming operations are at present practically in abeyance. Until rain falls in sufficient quantities to make the land workable, farmers are unable to proceed with preparations for the coming season's seeding.

*Veitch.*—Weather—Early in the month we had a fall of 49 points of rain, and this was the total rainfall for the month. Veitch average for same month, 135 points. Weather conditions have been good for stubble and scrub burning, and the opportunity was taken in most cases. Natural feed—Very dry; a little self-sown stubble feed is showing through. Stock—All in healthy condition. Pests—A considerable number of rabbits were destroyed with the poison cart during this month. Ploughs and cultivators are now at work in the district, but a good rain is required to make the work satisfactory.



## RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of March, 1918, also the average precipitation to the end of March, 1918, and the average annual rainfall.

| Station.                   | For March, 1918. | To end March, 1918. | Av'ge. to end March. | Av'ge. Annual Rainfall | Station.               | For March, 1918. | To end March, 1918. | Av'ge. to end March. | Av'ge. Annual Rainfall |
|----------------------------|------------------|---------------------|----------------------|------------------------|------------------------|------------------|---------------------|----------------------|------------------------|
| FAR NORTH AND UPPER NORTH. |                  |                     |                      |                        | LOWER NORTH—continued. |                  |                     |                      |                        |
| Oodnadatta .....           | —                | 0.95                | 1.88                 | 4.76                   | Spalding .....         | 0.79             | 2.62                | 2.09                 | 20.25                  |
| Tarcoola .....             | 2.22             | 3.37                | 1.27                 | 7.58                   | Gulnare .....          | 0.76             | 2.03                | 1.75                 | 19.74                  |
| Marree .....               | 0.19             | 1.14                | 1.46                 | 6.04                   | Bundaberg W. Wks. .... | 0.86             | 3.17                | 1.84                 | 17.29                  |
| Farina .....               | 0.30             | 0.70                | 1.70                 | 6.70                   | Yacka .....            | 0.60             | 1.26                | 1.68                 | 15.27                  |
| Leigh's Creek .....        | 0.49             | 0.81                | 1.89                 | 8.66                   | Koolunga .....         | 0.89             | 0.98                | 1.92                 | 15.84                  |
| Beltana .....              | 0.80             | 1.09                | 2.21                 | 9.22                   | Snowtown .....         | 0.50             | 0.67                | 1.81                 | 15.70                  |
| Blinman .....              | 0.74             | 1.18                | 2.62                 | 12.83                  | Brinkworth .....       | 0.67             | 2.01                | 1.85                 | 15.48                  |
| Hookina .....              | 0.66             | 0.95                | 1.38                 | —                      | Blyth .....            | 1.02             | 1.54                | 2.00                 | 16.34                  |
| Hawker .....               | 0.58             | 1.50                | 1.58                 | 12.22                  | Clare .....            | 1.29             | 2.04                | 2.74                 | 24.50                  |
| Wilson .....               | 0.40             | 0.40                | 1.68                 | 11.78                  | Mintaro .....          | 0.69             | 1.93                | 2.22                 | 21.69                  |
| Gordon .....               | 0.41             | 3.78                | 1.60                 | 10.26                  | Watervale .....        | 0.96             | 1.72                | 2.82                 | 27.31                  |
| Quorn .....                | 0.63             | 3.72                | 1.40                 | 13.78                  | Auburn .....           | 0.99             | 1.87                | 2.04                 | 24.25                  |
| Poft Augusta .....         | 0.76             | 2.12                | 1.60                 | 9.46                   | Hoyleton .....         | 0.75             | 1.23                | 2.08                 | 17.56                  |
| Port Augusta W. ....       | 0.75             | 2.21                | 1.40                 | 9.36                   | Balaklava .....        | 0.68             | 1.61                | 1.95                 | 16.63                  |
| Bruce .....                | 0.49             | 2.01                | 1.54                 | 10.01                  | Port Wakefield .....   | 1.07             | 1.25                | 2.08                 | 13.13                  |
| Hammond .....              | 0.68             | 2.07                | 1.70                 | 11.46                  | Terowie .....          | 0.53             | 1.33                | 2.01                 | 13.71                  |
| Wilmingon .....            | 0.87             | 3.68                | 2.04                 | 18.26                  | Yarcowie .....         | 1.32             | 2.38                | 2.04                 | 13.81                  |
| Willowie .....             | 0.55             | 1.31                | 1.66                 | 11.90                  | Hallett .....          | 0.57             | 1.21                | 1.90                 | 16.46                  |
| Melrose .....              | 1.14             | 3.69                | 3.06                 | 23.04                  | Mount Bryan .....      | 0.55             | 0.97                | 1.93                 | 15.73                  |
| Booleroo Centre .....      | 0.80             | 2.35                | 1.86                 | 15.83                  | Burra .....            | 0.51             | 1.11                | 2.33                 | 17.82                  |
| Port Germein .....         | 2.27             | 3.76                | 1.71                 | 12.84                  | Farrell's Flat .....   | 0.55             | 0.90                | 2.18                 | 18.87                  |
| Wirrabara .....            | 1.09             | 1.46                | 2.17                 | 18.91                  | WEST OF MURRAY RANGE.  |                  |                     |                      |                        |
| Appila .....               | 0.80             | 1.75                | 2.11                 | 15.08                  | Manoora .....          | 0.79             | 1.76                | 1.98                 | 18.66                  |
| Cradock .....              | 0.48             | 0.49                | 1.65                 | 10.86                  | Saddleworth .....      | 0.93             | 1.83                | 2.45                 | 19.69                  |
| Carrieton .....            | 0.67             | 1.52                | 1.69                 | 12.22                  | Marrabel .....         | 0.78             | 1.73                | 2.15                 | 18.84                  |
| Johnburg .....             | 0.47             | 1.38                | 1.44                 | 10.21                  | Riverton .....         | 0.82             | 1.31                | 2.45                 | 20.48                  |
| Eurelia .....              | 0.48             | 1.69                | 1.77                 | 13.24                  | Tarlee .....           | 0.97             | 1.70                | 2.23                 | 17.48                  |
| Orroroo .....              | 0.40             | 1.73                | 2.18                 | 13.42                  | Stockport .....        | 0.64             | 1.26                | 2.16                 | 15.89                  |
| Black Rock .....           | 0.41             | 1.62                | 1.94                 | 12.25                  | Hamley Bridge .....    | 0.44             | 1.11                | 2.21                 | 16.45                  |
| Peterborough .....         | 0.40             | 1.37                | 2.01                 | 13.07                  | Kapunda .....          | 1.06             | 1.82                | 2.60                 | 19.67                  |
| Yongala .....              | 0.68             | 1.73                | 1.57                 | 13.94                  | Freeling .....         | 0.78             | 1.60                | 2.35                 | 17.65                  |
| NORTH-EAST.                |                  |                     |                      |                        | Greenock .....         | 0.90             | 1.55                | 2.49                 | 21.46                  |
| Uoolta .....               | 0.27             | 1.87                | 0.65                 | —                      | Truro .....            | 1.25             | 1.95                | 2.33                 | 19.74                  |
| Naokara .....              | 0.30             | 2.15                | 1.52                 | —                      | Stockwell .....        | 0.91             | 1.65                | 2.30                 | 20.30                  |
| Yunta .....                | 0.48             | 1.08                | 1.62                 | 8.22                   | Nuriootpa .....        | 0.74             | 1.58                | 2.39                 | 21.25                  |
| Waukaringa .....           | 0.92             | 1.87                | 1.50                 | 7.94                   | Angaston .....         | 0.66             | 1.60                | 2.48                 | 22.25                  |
| Mannahill .....            | 0.65             | 2.06                | 1.64                 | 8.46                   | Tanunda .....          | 0.73             | 1.19                | 2.53                 | 22.38                  |
| Cockburn .....             | 0.97             | 1.42                | 1.68                 | 7.97                   | Lyndoch .....          | 0.61             | 1.22                | 2.28                 | 23.61                  |
| Broken Hill, NSW .....     | 0.63             | 2.17                | 2.02                 | 9.63                   | Williamstown .....     | 0.70             | 1.48                | 2.57                 | —                      |
| LOWER NORTH.               |                  |                     |                      |                        | ADELAIDE PLAINS.       |                  |                     |                      |                        |
| Port Pirie .....           | 1.20             | 2.77                | 1.79                 | 13.21                  | Mallala .....          | 0.37             | 0.88                | 2.08                 | 16.86                  |
| Port Broughton .....       | 0.80             | 0.80                | 1.74                 | 14.33                  | Roseworthy .....       | 0.66             | 1.14                | 2.25                 | 17.31                  |
| Bute .....                 | 0.81             | 0.96                | 1.75                 | 15.42                  | Gawler .....           | 0.66             | 0.96                | 2.37                 | 19.21                  |
| Laura .....                | 0.87             | 2.11                | 1.99                 | 18.22                  | Two Wells .....        | 0.42             | 0.89                | 2.03                 | 16.96                  |
| Caltowie .....             | 0.80             | 1.75                | 1.99                 | 17.27                  | Virginia .....         | 0.54             | 1.07                | 2.16                 | 17.56                  |
| Jamestown .....            | 0.71             | 1.60                | 2.07                 | 17.46                  | Smithfield .....       | 0.44             | 1.13                | 2.22                 | 17.30                  |
| Gladstone .....            | 1.14             | 2.29                | 1.86                 | 16.00                  | Salisbury .....        | 0.39             | 1.47                | 2.34                 | 18.57                  |
| Crystal Brook .....        | 1.03             | 1.40                | 1.85                 | 15.62                  | North Adelaide .....   | 0.83             | 1.66                | 2.51                 | 21.49                  |
| Georgetown .....           | 1.03             | 2.11                | 2.15                 | 18.32                  | Adelaide .....         | 0.50             | 1.07                | 2.41                 | 21.04                  |
| Narndy .....               | 1.12             | 1.21                | 1.98                 | 16.79                  | Brighton .....         | 0.81             | 1.69                | 2.44                 | —                      |
| Redhill .....              | 0.69             | 1.07                | 1.86                 | 16.79                  | Glenside .....         | 0.53             | 0.95                | 2.26                 | —                      |
|                            |                  |                     |                      |                        | Magill .....           | 0.62             | 1.38                | 2.84                 | 19.93                  |

## RAINFALL—continued.

| Station.                          | For March, 1918. | To end March, 1918. | Av'ge. to end March. | Av'ge. Annual Rainfall | Station.                                 | For March, 1918. | To end March, 1918. | Av'ge. to end March. | Av'ge. Annual Rainfall |
|-----------------------------------|------------------|---------------------|----------------------|------------------------|--|------------------|---------------------|----------------------|------------------------|
| <b>ADELAIDE PLAINS—continued.</b> |                  |                     |                      |                        | <b>WEST OF SPENCER'S GULF—continued.</b> |                  |                     |                      |                        |
| Glen Osmond ...                   | 0.61             | 1.71                | 2.63                 | 25.26                  | Talia ...                                | 0.94             | 0.94                | 0.93                 | —                      |
| Mitcham ...                       | 0.29             | 1.30                | 2.46                 | 23.47                  | Port Elliston ...                        | 0.71             | 0.79                | 1.38                 | 16.49                  |
| Belair ...                        | —                | 1.31                | 2.99                 | 28.64                  | Port Lincoln ...                         | 0.63             | 0.75                | 2.00                 | 19.88                  |
| <b>MOUNT LOFTY RANGES.</b>        |                  |                     |                      |                        | Tumby Bay ...                            | 0.38             | 0.81                | 1.56                 | 15.00                  |
| Teatree Gully ...                 | 0.57             | 1.72                | 3.11                 | 28.19                  | Carrow ...                               | 0.26             | 0.53                | —                    | —                      |
| Stirling West ...                 | 1.08             | 2.34                | 4.42                 | 46.70                  | Cowell ...                               | 0.49             | 1.00                | 1.72                 | 11.76                  |
| Uraidla ...                       | 0.81             | 2.56                | 4.36                 | 44.35                  | Point Lowly ...                          | 1.35             | 1.96                | 1.73                 | 12.21                  |
| Clarendon ...                     | 1.19             | 2.41                | 3.46                 | 33.67                  | Cummins ...                              | 0.24             | 0.66                | —                    | —                      |
| Morpeth Vale ...                  | 1.41             | 2.03                | 2.60                 | 23.32                  | Arno Bay ...                             | 0.18             | 0.54                | 1.84                 | —                      |
| Noarlunga ...                     | 1.36             | 1.81                | 2.20                 | 20.28                  | <b>YORK'S PENINSULA.</b>                 |                  |                     |                      |                        |
| Willunga ...                      | 1.03             | 1.78                | 2.71                 | 25.98                  | Wallaroo ...                             | 1.37             | 1.63                | 1.89                 | 14.05                  |
| Aldinga ...                       | 1.04             | 1.47                | 2.27                 | 20.34                  | Kadina ...                               | 1.24             | 1.71                | 1.80                 | 15.88                  |
| Normanville ...                   | 0.28             | 0.52                | 2.10                 | 20.65                  | Moonta ...                               | 1.66             | 1.84                | 1.81                 | 15.22                  |
| Yankalilla ...                    | 0.36             | 0.58                | 2.49                 | 22.78                  | Green's Plains ...                       | 0.60             | 1.30                | 1.64                 | 15.73                  |
| Cape Jervis ...                   | —                | —                   | 1.66                 | 16.34                  | Maitland ...                             | 0.70             | 1.30                | 1.98                 | 20.08                  |
| Mount Pleasant ...                | 0.69             | 1.55                | 2.74                 | 26.87                  | Androssan ...                            | 0.60             | 1.54                | 1.63                 | 13.89                  |
| Birdwood ...                      | 0.49             | 1.41                | 2.97                 | 29.38                  | Port Victoria ...                        | 0.38             | 0.61                | 1.54                 | 15.21                  |
| Gumeracha ...                     | 0.85             | 2.41                | 3.21                 | 33.30                  | Curramulka ...                           | 0.57             | 0.80                | 1.96                 | 18.50                  |
| Tweedvale ...                     | 0.74             | 2.04                | 3.10                 | 35.38                  | Minlaton ...                             | 0.65             | 0.95                | 1.75                 | 17.41                  |
| Woodside ...                      | 0.77             | 2.23                | 3.07                 | 31.87                  | Stansbury ...                            | 0.18             | 0.45                | 1.83                 | 17.06                  |
| Ambleside ...                     | 0.55             | 1.95                | 3.32                 | 35.45                  | Warooka ...                              | 0.70             | 0.83                | 1.56                 | 17.71                  |
| Nalme ...                         | 0.93             | 1.73                | 3.24                 | 28.63                  | Yorketown ...                            | 0.84             | 0.98                | 1.63                 | 17.47                  |
| Mount Barker ...                  | 0.83             | 2.06                | 3.32                 | 30.93                  | Edithburgh ...                           | 0.65             | 0.75                | 1.82                 | 16.48                  |
| Echunga ...                       | 0.74             | 2.33                | 3.41                 | 32.83                  | <b>SOUTH AND SOUTH-EAST.</b>             |                  |                     |                      |                        |
| Macclesfield ...                  | 0.88             | 2.11                | 3.19                 | 30.72                  | Cape Borda ...                           | 0.66             | 0.78                | 2.16                 | 25.09                  |
| Meadows ...                       | 1.04             | 2.02                | 3.78                 | 35.52                  | Kingscote ...                            | 0.54             | 0.99                | 1.86                 | 18.95                  |
| Strathalbyn ...                   | 0.54             | 1.06                | 2.48                 | 19.28                  | Penneshaw ...                            | 0.35             | 0.61                | 2.22                 | 21.34                  |
| Myponga ...                       | 0.78             | 1.95                | —                    | —                      | Cape Willoughby ...                      | —                | —                   | 2.15                 | 19.69                  |
| Millbrook Reservr.                | 0.59             | 2.38                | —                    | —                      | Victor Harbor ...                        | 0.68             | 1.33                | 2.45                 | 22.18                  |
| <b>MURRAY FLATS AND VALLEY.</b>   |                  |                     |                      |                        | Port Elliot ...                          | 0.92             | 2.22                | 2.38                 | 20.33                  |
| Wellington ...                    | 0.54             | 1.09                | 2.22                 | 15.01                  | Goolwa ...                               | 0.70             | 1.27                | 2.30                 | 17.93                  |
| Milang ...                        | 0.92             | 2.09                | 2.03                 | 16.08                  | Pinnaroo ...                             | 0.57             | 1.89                | 2.34                 | 16.74                  |
| Langhorne's Bldg                  | 0.55             | 0.78                | 1.96                 | 15.27                  | Parilla ...                              | 0.52             | 1.28                | —                    | —                      |
| Tailem Bend ...                   | 0.52             | 1.31                | 2.31                 | —                      | Lameroo ...                              | 0.58             | 1.57                | 2.05                 | 16.65                  |
| Murray Bridge ...                 | 0.46             | 0.99                | 2.11                 | 14.32                  | Parrakie ...                             | 0.30             | 0.96                | 1.89                 | —                      |
| Callington ...                    | 0.52             | 1.18                | 2.19                 | 16.65                  | Geranium ...                             | 0.29             | 0.44                | 2.23                 | —                      |
| Mannum ...                        | 0.44             | 0.50                | 1.84                 | 11.47                  | Peake ...                                | 0.44             | 0.90                | 2.47                 | —                      |
| Palmer ...                        | 0.56             | 0.65                | 2.20                 | 15.60                  | Cooke's Plains ...                       | 0.39             | 0.93                | 2.01                 | 14.74                  |
| Sedao ...                         | 0.77             | 1.31                | 1.69                 | 11.92                  | Meningie ...                             | 0.35             | 1.37                | 2.16                 | —                      |
| Blanchetown ...                   | 0.34             | 1.06                | 1.87                 | —                      | Coomandook ...                           | 0.35             | 1.01                | 2.09                 | 16.80                  |
| Eudunda ...                       | 0.66             | 1.04                | 2.17                 | 17.33                  | Coonalpyn ...                            | 0.31             | 1.40                | 2.11                 | 17.49                  |
| Sutherland ...                    | 0.55             | 0.95                | 1.43                 | 10.71                  | Tintinara ...                            | 0.20             | 1.06                | 2.18                 | 18.78                  |
| Morgan ...                        | 0.26             | 0.47                | 1.47                 | 10.60                  | Keith ...                                | 0.32             | 1.10                | 2.10                 | —                      |
| Overland Corner                   | 0.29             | 0.50                | 1.96                 | —                      | Bordertown ...                           | 0.17             | 1.08                | 2.17                 | 19.76                  |
| Renmark ...                       | 1.86             | 2.66                | 1.78                 | 11.42                  | Wolsley ...                              | 0.15             | 1.36                | 1.90                 | 17.72                  |
| Loxton ...                        | 0.35             | 0.86                | 1.52                 | 10.93                  | Frances ...                              | 0.15             | 1.10                | 1.28                 | 20.74                  |
| Swan Reach ...                    | 0.47             | 0.71                | 1.75                 | —                      | Naracorte ...                            | 0.31             | 1.04                | 2.04                 | 22.80                  |
| Waikerie ...                      | 0.35             | 1.10                | 1.46                 | —                      | Penola ...                               | 0.43             | 1.13                | 3.17                 | 26.78                  |
| <b>WEST OF SPENCER'S GULF.</b>    |                  |                     |                      |                        | Lucindale ...                            | 0.28             | 0.77                | 2.35                 | 23.32                  |
| Enala ...                         | 0.57             | 2.96                | 2.13                 | 19.13                  | Kingston ...                             | 0.73             | 1.09                | 2.42                 | 24.73                  |
| White Well ...                    | 0.39             | 0.46                | 1.54                 | 9.67                   | Robe ...                                 | 0.48             | 1.01                | 2.52                 | 24.69                  |
| Fowler's Bay ...                  | 0.72             | 0.73                | 1.39                 | 12.13                  | Beachport ...                            | 0.43             | 0.90                | 3.02                 | 27.51                  |
| Penong ...                        | 0.42             | 0.44                | 1.66                 | 11.91                  | Millicent ...                            | 0.81             | 1.34                | 3.03                 | 29.25                  |
| Murat Bay ...                     | 0.82             | 0.92                | 0.79                 | —                      | Mount Gambier ...                        | 0.50             | 1.27                | 3.99                 | 32.00                  |
| Smoky Bay ...                     | 0.43             | 0.48                | —                    | —                      | C. Nrthumberland                         | —                | —                   | 2.98                 | 26.63                  |
| Streaky Bay ...                   | 0.58             | 0.60                | 1.54                 | 15.31                  | Kalangadoo ...                           | 0.48             | 1.52                | —                    | —                      |

## AGRICULTURAL BUREAU REPORTS.

## INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

| Branch.               | Report<br>on<br>Page | Dates of<br>Meetings. |       | Branch.               | Report<br>on<br>Page | Dates of<br>Meetings. |      |
|-----------------------|----------------------|-----------------------|-------|-----------------------|----------------------|-----------------------|------|
|                       |                      | April.                | May.  |                       |                      | April.                | May. |
| Amyton .....          | 726                  | —                     | —     | Forster .....         | *                    | —                     | —    |
| Angaston .....        | *                    | —                     | —     | Frances .....         | *                    | —                     | —    |
| Appila-Yarrowie ..... | *                    | —                     | —     | Freeling .....        | *                    | 26                    | 23   |
| Arthurton .....       | 733                  | —                     | —     | Gawler River .....    | 732                  | 29                    | 27   |
| Ashbourne .....       | 739                  | 29                    | 27    | Georgetown .....      | *                    | —                     | —    |
| Balaklava .....       | *                    | —                     | —     | Geranium .....        | *                    | 27                    | 25   |
| Beaufort .....        | *                    | —                     | —     | Gladstone .....       | †                    | —                     | —    |
| Beetaloo Valley ..... | 728                  | —                     | —     | Glencoe .....         | 745                  | —                     | —    |
| Belalie North .....   | *                    | 20                    | 26    | Glencoe .....         | *                    | —                     | —    |
| Berri .....           | *                    | 24                    | 29    | Goode .....           | 734                  | —                     | —    |
| Blackheath .....      | 739                  | 20                    | 25    | Green Patch .....     | *                    | —                     | —    |
| Blackwood .....       | *                    | 15                    | 20    | Gumeracha .....       | 739                  | 25                    | 24   |
| Blyth .....           | *                    | —                     | —     | Halidon .....         | 736                  | —                     | —    |
| Bookpurnong East ..   | *                    | —                     | —     | Hartley .....         | 740                  | —                     | —    |
| Booleroo Centre ..... | †                    | 26                    | 24    | Hawker .....          | *                    | 23                    | 28   |
| Borrika .....         | *                    | —                     | —     | Hilltown .....        | *                    | —                     | —    |
| Bowhill .....         | *                    | —                     | —     | Hookina .....         | 728                  | 23                    | 21   |
| Brentwood .....       | *                    | 26                    | 23    | Inman Valley .....    | 740-4                | —                     | —    |
| Brinkley .....        | 738                  | 27                    | —     | Ironhank .....        | *                    | —                     | —    |
| Bundaleer Springs ..  | *                    | —                     | —     | Julia .....           | *                    | —                     | —    |
| Burra .....           | *                    | —                     | —     | Kadina .....          | *                    | —                     | —    |
| Bute .....            | 733                  | —                     | —     | Kalangadoo .....      | 745                  | 13                    | 11   |
| Butler .....          | *                    | —                     | —     | Kanmantoo .....       | 741                  | 20                    | 26   |
| Caltowie .....        | *                    | —                     | —     | Keith .....           | *                    | —                     | —    |
| Canowie Belt .....    | *                    | —                     | —     | Ki Ki .....           | 745                  | —                     | —    |
| Carrieton .....       | 728                  | —                     | —     | Kingscote .....       | *                    | —                     | —    |
| Carrow .....          | *                    | —                     | —     | Kingston-on-Murray .. | *                    | —                     | —    |
| Cherry Gardens .....  | 743                  | 23                    | 21    | Kongorong .....       | *                    | 23                    | 21   |
| Clanfield .....       | *                    | —                     | —     | Koomibba .....        | 735                  | 25                    | 23   |
| Clare .....           | *                    | —                     | —     | Koppio .....          | *                    | 2                     | 7    |
| Clarendon .....       | 729                  | —                     | —     | Kybyholite .....      | *                    | 19                    | 26   |
| Claypan Bore .....    | *                    | —                     | —     | Lameroo .....         | *                    | —                     | —    |
| Colton .....          | *                    | —                     | —     | Laura .....           | 729                  | 19                    | 17   |
| Coomandook .....      | *                    | —                     | —     | Leighton .....        | *                    | —                     | —    |
| Coomooroo .....       | *                    | —                     | —     | Lenswood and Forest   |                      |                       |      |
| Coonalpyne .....      | *                    | —                     | 2, 24 | Bange .....           | †                    | —                     | —    |
| Coonawarra .....      | 744                  | —                     | —     | Lone Pine .....       | *                    | —                     | —    |
| Coobera .....         | *                    | —                     | —     | Longwood .....        | *                    | —                     | —    |
| Cradock .....         | 726                  | —                     | —     | Loxton .....          | *                    | —                     | —    |
| Crystal Brook .....   | 728                  | —                     | —     | Lucindale .....       | *                    | 20                    | —    |
| Cummins .....         | *                    | 27                    | 25    | Lyndoch .....         | 732                  | —                     | —    |
| Cygnat River .....    | *                    | 25                    | 23    | MacGillivray .....    | 744                  | —                     | —    |
| Davenport .....       | *                    | —                     | —     | Maitland .....        | 734                  | —                     | —    |
| Dawson .....          | *                    | —                     | —     | Mallala .....         | *                    | 8                     | 13   |
| Denial Bay .....      | *                    | —                     | —     | Mangalo .....         | *                    | —                     | —    |
| Dowlingville .....    | *                    | —                     | —     | Mantung .....         | *                    | —                     | —    |
| Edillilie .....       | *                    | —                     | —     | Meadows .....         | *                    | 23                    | 21   |
| Elbow Hill .....      | *                    | —                     | —     | Meningie .....        | *                    | —                     | —    |
| Eurelia .....         | *                    | —                     | —     | Merihah .....         | *                    | —                     | —    |

## INDEX TO AGRICULTURAL BUREAU REPORTS—continued.

| Branch                | Report on Page | Dates of Meetings. |           | Branch                | Report on Page | Dates of Meetings. |      |
|-----------------------|----------------|--------------------|-----------|-----------------------|----------------|--------------------|------|
|                       |                | April.             | May.      |                       |                | April.             | May. |
| Milang .....          | *              | 13                 | 11        | Port Germein .....    | *              | —                  | —    |
| Millicent .....       | 745            | 9                  | 14        | Port Pirie .....      | 730            | 20                 | 25   |
| Mitatie .....         | 735            | 20                 | 25        | Quorn .....           | *              | 20                 | 25   |
| Mindarie .....        | 736            | 1                  | 6         | Ramco .....           | 737            | 22                 | 20   |
| Minlaton .....        | 734            | 19                 | 17        | Redhill .....         | *              | —                  | —    |
| Minnipa .....         | *              | —                  | —         | Renmark .....         | *              | —                  | —    |
| Mintaro .....         | *              | 20                 | 25        | Riverton .....        | 732            | —                  | —    |
| Mitchell .....        | *              | —                  | —         | Riverton (Ladies) ..  | 732            | —                  | —    |
| Monarto South .....   | 738            | —                  | —         | Roberts and Verran .. | *              | —                  | —    |
| Moonta .....          | *              | —                  | —         | Rosedale .....        | *              | —                  | —    |
| Moorlands .....       | *              | —                  | —         | Rosy Pine .....       | *              | —                  | —    |
| Morchard .....        | 727            | 27                 | 25        | Saddleworth .....     | *              | 20                 | 18   |
| Morgan .....          | *              | —                  | —         | Salisbury .....       | 732            | —                  | —    |
| Morphett Vale .....   | 744            | —                  | —         | Salt Creek .....      | *              | —                  | —    |
| Mount Barker .....    | 741-2          | 24                 | 22        | Sandalwood .....      | *              | —                  | —    |
| Mount Bryan .....     | *              | —                  | —         | Sherlock .....        | *              | —                  | —    |
| Mount Bryan East ..   | *              | —                  | —         | Spalding .....        | *              | —                  | —    |
| Mount Compass .....   | *              | —                  | —         | Stockport .....       | *              | —                  | —    |
| Mount Gambier .....   | 746-7          | 13                 | 11        | Strathalbyn .....     | 744            | 23                 | 21   |
| Mount Hope .....      | *              | 20                 | 25        | Sutherland .....      | *              | —                  | —    |
| Mount Pleasant .....  | *              | —                  | —         | Talia .....           | *              | 13                 | 11   |
| Mount Remarkable ..   | †              | 17                 | 15        | Tantanoola .....      | *              | 6                  | 4    |
| Mundalla .....        | *              | 24                 | 22        | Tareowie .....        | 727            | 23                 | 21   |
| Mundoora .....        | *              | —                  | —         | Tatara .....          | *              | 6                  | 4    |
| Murray Bridge .....   | *              | 23                 | 21        | Tintinnara .....      | *              | —                  | —    |
| Myponga .....         | *              | —                  | —         | Two Wells .....       | *              | —                  | —    |
| Myponga .....         | *              | —                  | —         | Uraidla and Summert'n | *              | 1                  | 6    |
| Myra .....            | *              | —                  | —         | Waikerie .....        | *              | —                  | —    |
| Nantawarra .....      | *              | —                  | —         | Warcovie .....        | *              | —                  | —    |
| Naracoorte .....      | *              | —                  | —         | Warrow .....          | *              | —                  | —    |
| Narriby .....         | *              | —                  | —         | Watervale .....       | *              | —                  | —    |
| Narrung .....         | *              | —                  | —         | Wepowie .....         | 727            | 20                 | 25   |
| Netberton .....       | 736            | —                  | —         | Whyte-Yarcowie .....  | 731            | 15                 | 20   |
| North Booborowie ..   | *              | —                  | —         | Wilkawatt .....       | *              | —                  | —    |
| North Bundaleer ..... | *              | —                  | —         | Willowie .....        | 728            | 23                 | 21   |
| Northfield .....      | †              | 2                  | 7         | Wilmington .....      | 727            | —                  | —    |
| Nunkeri and Yurgo ..  | 736            | —                  | —         | Wirrabara .....       | 731            | —                  | —    |
| O'Loughlin .....      | 735            | —                  | —         | Wirrega .....         | *              | —                  | —    |
| Orroroo .....         | *              | —                  | —         | Wolawa .....          | *              | —                  | —    |
| Parilla .....         | *              | —                  | —         | Woodleigh .....       | *              | —                  | —    |
| Parilla Well .....    | *              | —                  | —         | Woodside .....        | *              | —                  | —    |
| Parrakie .....        | *              | —                  | —         | Wynarka .....         | *              | —                  | —    |
| Paskeville .....      | *              | —                  | —         | Yabmana .....         | *              | —                  | —    |
| Penola .....          | *              | —                  | —         | Yaoka .....           | *              | —                  | —    |
| Penong .....          | *              | 13                 | 11        | Yadnarie .....        | *              | —                  | —    |
| Petina .....          | *              | —                  | —         | Yallunda .....        | *              | —                  | —    |
| Pine Forest .....     | *              | —                  | —         | Yaninee .....         | 735            | —                  | —    |
| Pinnaroo .....        | *              | —                  | —         | Yeelanna .....        | 735            | —                  | —    |
| Pompoola .....        | *              | 3, 17              | 1, 15, 23 | Yongala Vale .....    | *              | 19                 | 24   |
| Port Broughton .....  | *              | —                  | —         | Yorketown .....       | *              | —                  | —    |
| Port Elliot .....     | *              | 20                 | 18        |                       |                |                    |      |

\* No report received during the month of March.

† Formal report only received.

## THE AGRICULTURAL BUREAU.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

### REPORTS OF BUREAU MEETINGS.

#### UPPER-NORTH DISTRICT.

##### (PETERBOROUGH AND NORTHWARD.)

AMYTON (Average annual rainfall, 11.82in.).

February 26th.—Present: 11 members and four visitors.

HOW TO MAKE THE BUREAU A SUCCESS.—Mr. W. Gum, in a paper on this subject, said all the assistance that the Government and the officers of the Department of Agriculture might give to the various Branches of the Agricultural Bureau would be of no avail unless the individual members of the Branch did their part in creating an interest in the work of the Bureau, and endeavored to make the meetings a success. The Branch, besides giving certain privileges to its members carried with it certain duties, that members should at all times observe. If each member carried out the following rules the meetings would awaken much more interest. Endeavor to attend all meetings, be punctual, take part in discussions, and from time to time contribute an item on the programme. He considered that a new chairman should be elected at each annual meeting, in order that new life and energy might be infused into the meetings. The success of the Branch depended chiefly on the Secretary. He must of necessity be energetic, but without the co-operation of the members he would have a very hard struggle to make the Branch a success. Not only should members take an interest in the meetings of the Branch, but they should also carry out on their farms experiments of various descriptions, such as testing different varieties of wheat, manure, and time of working the land, sowing the wheat, and pickling seed. The results of such experiments would be a source of interest to almost every agriculturist in the district. The paper was well discussed. The subject of "Compulsory Dipping of Sheep" also came in for a lengthy discussion. It was agreed that compulsory dipping was not necessary in that district because of the very dry climate.

CRADOCK (Average annual rainfall, 10.86in.).

March 2nd.—Present: seven members.

The meeting discussed the subject of compulsory dipping of sheep, when it was unanimously agreed that the Act should not be enforced in those areas outside Goyder's line of rainfall, as the sheep tick or lice would not live or breed in those northern areas. The subject of noxious weeds was also discussed. Mr. T. N. McGillick reported that he had used water poisoned with arsenic for the destruction of rabbits with good results, but unfortunately a number of sheep and cattle had died through eating the bones of the poisoned animals.

##### HOOKINA.

February 26th.—Present: eight members.

DEALING WITH THE RABBIT PEST.—Mr. B. Sheridan expressed the opinion that the rabbit was by far the worst pest that the farmer in the northern districts had to deal with, in a paper under the above heading. They played great havoc with the wheat crops and feed, and practically destroyed all young trees by ring-barking them. In his opinion spring traps and the poison cart were the best two methods of destroying them. During the summer months all water catchments should be fenced in with wire netting. The wire should be lapped in about 3in. on the top of the ground and secured down by using wire pins about 6in. long. That was a better method than putting the bottom of the netting in a trench, because the rabbits were not so inclined to dig out. The netting should lean slightly inwards.

on the top, to prevent the rabbits from climbing over it. A V-shaped end should be formed in the netting, with a sleeve about 18in. long and 8in. or 9in. in diameter, and gradually getting smaller, leaving just enough room to enable a large rabbit to pass through into the yard formed by the netting. At wells where the water trough could be covered good results would be obtained by the use of cyanide, arsenic, and strychnine.

**MORCHARD** (Average annual rainfall, 11in. to 12in.).

February 23rd.—Present: 21 members and three visitors.

**COMPULSORY DIPPING OF SHEEP.**—A discussion on this question was initiated by Mr. E. J. Kitto, who stated that he had not found any ticks on Merino sheep during dry seasons. He was strongly opposed to compulsory dipping for sheep in the northern portions of the State that were free from tick. Mr. Riechstein stated that even if tick-infested sheep were brought into that district they would disappear in less than two years. He was convinced that compulsory dipping was not required for Merino sheep in the North. Messrs. Brown, Scriven, and McCallum also spoke in similar terms.

**TARCOWIE** (Average annual rainfall, about 15in.).

February 26th.—Present: nine members and one visitor.

**BEST WHEAT FOR DISTRICT.**—Mr. J. Symons, in the course of a paper on the above subject, said as far as that district was concerned there could be no doubt that Federation was the best wheat to grow for grain. Other wheat, such as Marshall's No. 3, Dart's Imperial, &c., had also given good returns, but as they were later wheats, he did not think it advisable to sow them in large quantities. Should a spell of dry weather be experienced during either September or October, the yields would, in all probability, be very light. In naming the best wheat for the district one should not lose sight of the fact that good returns for hay should also be studied. He did not think Federation was a good wheat for hay on account of the short growth and brittle nature of the straw. He would therefore advise the growing of some of the wheats previously mentioned. Mr. J. Smith, in opening a discussion on the paper, agreed with the views expressed therein, and favored Crossbred 51 as a good wheat for hay. Mr. H. Edwards said Crossbred 51 was also a good harvesting wheat. Mr. W. S. Ninnee favored Dart's Imperial both for grain and hay.

**WEPOWIE** (Average annual rainfall, 13in. to 14in.).

March 16.—Present: 11 members and two visitors.

**NOXIOUS WEEDS AND RABBIT DESTRUCTION.**—Mr. J. Crocker, in opening a discussion on this topic, strongly advised members to destroy star thistles, Bathurst burrs, and all other useless weeds. In dealing with the destruction of rabbits, he mentioned several methods that could be adopted with a fair amount of success, such as poisoning and the netting in of the dams.

**WILMINGTON** (Average annual rainfall, 18.26in.).

February 27th.—Present: nine members.

**RECOMMENDATIONS FOR FARMERS.**—In a short paper under this title Mr. T. D. Peek first of all recommended that every farmer in that district should become a member of the Agricultural Bureau. Then he said the subject of mixed farming should also receive careful consideration. He thought it would be an advantage if sheep, cows, pigs, and poultry were kept in conjunction with wheat growing, but one should be careful not to over stock the farm. A smaller area sown for crop, and the fallow well worked and kept thoroughly clean, would in the majority of cases yield much better than larger ones put in carelessly. The paddocks should be evenly divided, and with each one leading into the other, and all fences kept in good repair. If the haystacks and chaffhouse were conveniently situated adjoining the stables much time and labor would be saved. The question of a good supply of water should be carefully studied—where wells were not in use the dams should be properly cared for. The shortage of labor was an item for serious consideration, and he thought farmers could not do better than co-operate with each other wherever possible.

CARRLETON, February 20th.—Members discussed the results of the harvest, and the general opinion was that even despite the mice plague and late sowing the yields had been satisfactory. The Hon. Secretary (Mr. T. H. Fuller) tabled a sample of standard wheat.

WILLOWIE, March 1st.—The Hon. Secretary (Mr. W. P. Foulis) read a paper on the subject of "Sheep on the Farm," and a good discussion followed.

### MIDDLE-NORTH DISTRICT.

(PETERBOROUGH TO FARRELL'S FLAT.)

BEETALOO VALLEY (Average annual rainfall, 18in. to 19in.).

February 25th.—Present: eight members and one visitor.

HORSE-BREEDING.—A short paper dealing with this question was contributed by Mr. E. E. Klemm, in which he gave some of the chief points that one should consider when setting out to breed horses. The services of the best sire in the district, he said, should be procured. The mare should not be younger than three years old at the time of the first service. He considered it was advisable to keep the mare in steady work until about three weeks of foaling time, in order that she would not become too fat. After foaling she could then be put on the best of food. At the age of six months the foals could be weaned and fed on good strengthening food.

CRYSTAL BROOK (Average annual rainfall, 15.82in.).

February 23rd.—Present: 23 members.

BUNT, OR STINKING SMUT.—The following paper was contributed by Mr. R. R. Shaw. The Australian wheatgrower, he said, would find his occupation much more profitable if he had not to contend against the many diseases that the wheat plant encountered during its life. The farmer had to wage a continual war against these diseases, utilising different methods that might hold them in check, and should he relax his efforts in combating them his returns would be seriously curtailed. That had been the experience of many farmers during last harvest through not pickling their seed wheat. "Bunt," he continued, "is a parasitic fungus plant, living on the sap of the parent wheat plant. Its seeds, or spores, germinate in the soil like any other plant, sending out mycelium root threads. These threads enter the tender wheat plant through pores, grow up between the cells of the stem, enter the ear of the plant, and produce the spores or black powder called smut inside the skin that should have contained the sound wheat grain. This explains why the heads of wheat may have smut balls on one part of it and not on the other part, the fertile branches growing up between the cells of the stem may be only sufficient to enter part of the ears to form the smut balls. The smut affects the wheat crops by the spores of the smut coming into contact with the seed wheat. The smut balls which are contained in the skin of the wheat grain are harvested at the same time as the sound grain, and being easily broken, and containing millions of spores, very soon affected the sound grain. The preventive methods for smut that are mostly adopted in South Anstralia are different fungicide pickles, such as bluestone or formalin solutions, the former being generally used for the purpose, but the great objection to its use is that if made too strong it will not only delay germination, but destroy a large percentage of the seed germs. A 1 per cent. solution is quite strong enough if the seed is fairly free from smut, but if it is badly affected a 1½ per cent. solution may be used. This latter strength should never be exceeded, as it has been conclusively proved that even a 1 per cent. solution not only retards germination, but destroys a big percentage of the wheat germs. It has been shown that by using salt water instead of fresh the harmful effects of the bluestone is modified to a great extent. The ideal pickle for smut would be in the form of a dry powder, sufficiently strong to destroy the smut spores, yet not injure the seed germs or retard germination. The writer had very encouraging results from experiments on these lines that were carried out on our experimental plots in 1916. At the same time the New South Wales Agricultural Department were also carrying out experiments on similar lines. They state that one of their experiments

made with a dry powder (chloride of copper) exceeded all their expectations, as the wheat grown from seed treated with the powder was free from smut, the germination was not retarded, the cost reasonable, and the method of treating the seed was more simple. The most encouraging aspect of this method is that the strength of the pickle cannot be increased, therefore it cannot damage the germ of the seed. It is entirely different with a fluid pickle. The yearly loss of seed through pickling in too strong a solution is more serious than what is generally known. A great number of farmers, if asked what strength they make their solution for a bluestone pickle, will answer "so many pounds of bluestone to so many bags of wheat," ignoring the fact that the amount of water added to the bluestone governs the strength of the solution. It would be a simple matter for any farmer to test the destructive action of a strong bluestone pickle by treating, say, 100 grains of wheat, plant them, and note results. Formalin in the proportion of 1lb. of formalin to 40galls. of water is used to a fairly large extent, but, because of its liability to adulteration, and the need of immediately sowing the grain, bluestone is at present the more reliable of the two. The bottom part of the mycelium threads that enter the young wheat plants dies as the wheat gets well above the ground, so that most of the threads in a diseased plant are near the top, and none below the ground. Such being the case, the eating off or mowing close to the ground would clear a crop of smut, but that would have to be done so late in the spring that the cure would not justify the risk. When smutty seed wheat is sown in a dry soil, it will very often give a clean crop, free from smut. The reason for this is there is sufficient moisture in the soil to germinate the smut spores, but not enough to germinate the grain, consequently the fungus has no young wheat plant to attack, and so dies. The statement has been repeatedly made by farmers that they have sown pickled wheat in a dry soil and have had the resultant crop badly affected with smut, also that they have sown unpickled smutty seed in wet soil and have reaped a crop quite free from smut. These statements have been made by men who's word is beyond any shadow of doubt, but it is more than likely that the conditions have deceived them. Some wheats are smut-resisting, such as Bunyip, Florence, Cedar, &c. This, or some other unsuspected cause may have given a result contrary to what was expected. During this last season the writer carried out an experiment with Bunyip wheat. One hundred grains were thoroughly impregnated with the smut spores, and then planted in wet soil; only 33 grains germinated, the balance were no doubt eaten by mice. Not one grain of the heads on the 33 stools was affected with smut. Of course this is not sufficient proof that Bunyip is smut proof, other tests may or may not confirm it. Among other ideas advanced by farmers as to the origin or cause of smut is that climatic or atmospheric conditions may account for it, as some years it is far worse and more general than others. It is very consoling to know that this disease of the wheat plant is to a great extent preventable, not like red rust and takeall, which are far more difficult to contend with. Nowadays farmers are more conversant with plant diseases and the methods to combat them, but there is still a lot to be done in this respect. If by combined action this one disease can be wiped out it would mean a large saving to the Commonwealth and to the farmers in particular.

#### LAURA.

February 22nd.—Present: 10 members.

ARTIFICIAL HATCHING OF CHICKENS.—Mr. F. Millington, in the course of a paper on this subject, said:—"Some years ago I purchased a tank machine of 100-egg capacity from a city maker, which for a number of years gave me the greatest satisfaction of its quality during the hatching season. I also hired a hot-air machine of the same holding capacity. Therefore I had a hot-water machine and a hot-air machine going side by side, and the conditions were, of course, identical. However, when the hatch was over, from 90 fertile eggs I got 85 chicks from the hot water or tank machine; from 89 fertile eggs I got 72 chicks, hot-air machine. In the tank machine there were five dead in the shell, and in the hot air machine there were 15 dead in the shell, the other two having decayed in the embryo stage. I have measured the amount of kerosine used in both machines. The one with the slide used a trifle over 8pts. for a 21-day hatch, and the cylinder and damper used nearly a tin (4galls.) for the same time.



Most of the machines on the market are good, only some are a bit better than others, and a person must find out the best for himself. Personally, I prefer the tank machine, for this reason—with a tank kept well filled a more even warmth is produced, and is more equally spread over the surface of the eggs; and should the lamp, by some mischance, go out, the warmth in the egg chamber is kept up for a few hours, and the eggs will not be harmed thereby. As regards the hot air machine, it will produce the required temperature in less time than the tank machine, unless the operator fills his tank with hot water, an action which must be very carefully done, for if the heat is too sudden the capsule will undoubtedly be permanently injured; and should the lamp become extinguished, the machine rapidly cools down and the whole hatch may be spoiled. There is another item of vital consideration. That is, the quantity of kerosine used by a machine. There are two kinds made—one has a self-acting flame-reducing slide, which, when the thermometer has registered the temperature it is set to, there it will remain, while 103deg. are registered; but should it cool a little, the slide and capsule being so sensitive, the reducer will lower and the flame will increase; and so it goes on. The other make has a cylinder and damper, which rises automatically and allows the heat to escape. That being so, the flame is much larger than required, and is using oil unnecessarily, therefore it is wasted; and from personal experience I vote every time for the tank machine with the flame-reducing slide. But no machine in the known world is a bit of good if the operator is careless. I have tried both ways in incubating, also in rearing the production of the big hen, and have proved that success will follow if care, attention, and cleanliness are exercised. We often hear of a failure during incubation, death in the shell being the trouble. Where the eggs are from first-class properly fed stock, and the machine operated on under good conditions, the dead-in-the-shell problem may be cleared up, as for the want of necessary moisture, and in order to overcome that trouble, water-trays are placed in the machine under the egg chamber, with a piece of flannel spread on the bottom, and kept well covered with clean, pure water—that will often overcome the trouble. I think that shows that the tank machine produces more moisture than the hot-air machine does. Some people often dip the egg in lukewarm water, but that is rather a dangerous procedure with incubators, as by the time you dip your last egg the first one has become cold, and the chick may be chilled. A good plan is to steep a piece of flannel or blanket in hot water, and then, after lightly wringing, spread it over the eggs, and this dissolves and softens the shell, and the beneficial effects of this method are well known. The flannel should remain on the eggs until dry, so as to prevent the eggs getting a chill. We shall shortly again have the breeding season with us, and intending breeders, if only backyard men, should begin to think of what they are going to do. I have recently read that a member of the All Game Club has produced a most excellent table cross, one being the Wyandotte hen and Modern Game male; the other a Rhode Island Red hen mated with the same male, the flesh being a good color. As chickens, they are hardy, quick growers, and fatten well. Last year I procured a setting of Plymouth and Wyandotte cross, and such chicks I never before had seen, the cockerels at five to seven months old, when dressed, weighing from 6lbs. to 8½lbs. For the table a cross with Rhode Island Red hens and a Game male bird must hold the pride of place, in my opinion."

#### PORT PIRIE (Average annual rainfall, 13.2lin.).

January 26th.—Present: eight members.

FEATURES OF THE YEAR 1917.—Under this heading a paper was contributed by Mr. J. Greig. Apart from the war and the burdens and difficulties that it entailed, he said, the year for South Australia had been a prosperous one. No outstanding feature had occurred, yet there were points that could be considered as they emphasized the fact that good crops could be produced under diverse conditions. The years 1915-16, 1916-17, and 1917-18 had all been good seasons, yet the conditions were widely different in each case. The rainfall for the year 1915 was 14.58in., yet the harvest had proved to be one of the best on record. The first three months' fall was 0.94in., which fell during January; February and March being without rain. The last three months' fall was 1.90in. Thus 11.74in. fell during the growing period. In 1916 there was no rain in January or February, and only 31 points during March. April registered 11 points, or 42 points for the first four months of the year. The remaining eight months showed over 19in. of

rain, of which 6.92in. fell during the last three months of the year. That rain damaged many crops, and entailed considerable labor and expense. For the year 1917, 19.72in. were registered. The first four months showed a fall of 4.65in., which delayed seeding. During the next six months continuous steady rain fell. The following figures showed that there was only a small difference in the respective months:—May, 2.13in.; June, 2.52in.; July, 2.22in.; August, 1.96in.; September, 2.34in.; October, 2.18in.; total, 13.35in. For the same six months of the year 1915 the falls were as follows:—May, 3.03in.; June, 1.21in.; July, 2.08in.; August, 1.32in.; September, 2.23in.; October, 1.29in.; total, 11.17in.; whilst the total fall for the year was 14.58in. In 1916 the falls were:—May, 1.52in.; June, 3.38in.; July, 2.81in.; August, 2.27in.; September, 1.76in.; October, 1.36in.; total, 13.6in. The other six months recorded practically 6in., the total fall for the year being 19.59in. It would thus be seen that if a moderate rainfall of, say, 10in. to 11in., was registered during the six months, May to October, it was sufficient to produce a good wheat crop; but the rain of the last two and first four months of the following year could be conserved in the soil, and it would help to produce the following season's crop; but with a rainfall of 13in. to 14in. for the seven months, April to October inclusive, and falling at about 2in. per month, the wheat farmer would be quite as well off without any other rain. In support of that contention he quoted past records. For 1911 the fall was 14.15in.; 1912, 16.03in.; 1913, 10.14in.; 1914, 6.92in.; whilst 1915, with a rainfall of 14.58in., registered a record harvest. Surely no one would contend that there was much moisture conserved in the soil at the end of two of the driest years experienced. Although they might be able to grow wheat very successfully on 14in. of rain they could not be sure of getting that quantity, so it was well to conserve all the moisture in that northern part of the State.

#### WHYTE-YARCOWIE (Average annual rainfall, 13.91in.).

February 25th.—Present: seven members.

HARVEST REPORTS.—Mr. G. McGregor, in opening a discussion on this topic, said even with the adversities that farmers had had to contend with, namely, the mice plagues and the excessive wet weather, the majority of crops in that district had turned out satisfactory. He had noticed that the stubble land reaped that year had been very badly affected with rust. Mr. F. H. Lock reported that he had sown Yandilla King that had not been pickled before rain had fallen, and it was almost free from smut. The same variety of wheat had been well pickled and sown after rain, with the result that the sample returned was very smutty. Mr. Hunt reported that the early wheats sown by him had yielded much better than the later varieties. Mr. W. G. Mudge had noticed that the thin patches of wheat gave better returns than those where the crop was thicker. After a further discussion it was generally agreed that Federation was the wheat best suited to the requirements of that district.

#### WIRRABARA (Average annual rainfall, 18.91in.).

March 16th.—Present: 20 members.

THE ERECTION OF HAY SHEDS.—Mr. W. Bowman, who contributed a paper on this subject, said every farmer should build a shed in which to store his hay. He recognised that the present price of galvanized iron was too great to permit of that being used, but there were other materials that would answer the purpose. Even a shed roofed with straw would save a considerable amount of time during haymaking. A skillion roof should be built, because it allowed more room for pitching the hay into the shed. If possible the shed should be erected north and south with the front facing the east, as it was very seldom that bad weather came from that direction. A structure 96ft. long, 24ft. wide, and 18ft. high would hold about 110 tons of hay, which was about the average amount required by the farmers of that district. To construct the shed the following timber would be required:—27 poles, nine of which should be 22ft. long; nine 19ft. long and nine 16ft. long; 24 wall plates 15ft. in length, 72 rafters 18ft. long, and enough small rails to prevent the straw falling through, whilst the shed was being thatched. The poles should be sunk 4ft. into the earth, and the holes filled with concrete. In order that the bottom of the shed might be kept clean and level he advised putting down a concrete floor.

### LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

GAWLER RIVER (Average annual rainfall, 17in. to 18in.).

February 25th.—Present: 14 members and one visitor.

AUSTRALIA: A NATION.—Mr. J. Hayman contributed a paper, entitled "Can Australia become a Nation?" in the course of which he referred to the civic responsibilities of the population, and emphasized the need for discipline. He touched on some of the problems of repatriation, expressing the opinion that returned soldiers should not be asked to break up mallee lands, and favored, in preference to the idea of settling the men in colonies, their diffusion throughout the fertile districts. The country should be made as near self-supporting as possible. A good general discussion followed.

LYNDGOCH (Average annual rainfall, 23.01in.).

January 24th.—Present: 15 members.

A discussion on the prevalence of Salvation Jane in that district took place. Mr. F. Klauber tabled a branch of Early Dwarf Red tomatoes. Mr. H. Springbett also tabled samples of Hunter River and Salt Lake City Lucerne.

RIVERTON (LADIES) (Average annual rainfall, 20.48in.).

March 26th.—Present: 15 members and 15 visitors.

The Poultry Expert (Mr. D. F. Laurie) delivered an address on the "Poultry Industry." The lecturer urged the members to market their eggs in the best conditions possible. He stated that South Australia lost a large amount of money through the marketing of stale eggs. In Sydney more care was taken of the eggs, and better prices were always obtainable there. The lecturer then dealt with the various diseases of poultry and the remedies for same.

RIVERTON (Average annual rainfall, 20.48in.).

March 26th.—Present: 13 members and 20 visitors.

The Poultry Expert delivered an address on the "Management of Poultry." Several members of the Ladies' Branch were also present.

SALISBURY (Average annual rainfall, 18.57in.).

March 5th.—Present: 11 members and one visitor.

WHEAT AND HAY-GROWING VERSUS STOCK.—The meeting took the form of a debate on the above subject. Mr. John Harvey read the following paper on the question of "Wheat and Hay-growing":—"Mixed farming," he said, "carried on under the following three headings, namely, wheat and oats, fallow, and grazing, was most profitable on the small farms of the Lower Northern districts. To take as an example the returns from 100 acres of crop (60 acres of wheat and 40 acres of oats), and base the calculations of the last three years at 25bush. to the acre, the returns from the holding could be set out as under:—

|   | £    | s. | d. |
|---|------|----|----|
| Wheat (or hay), 60 acres, average 25bush., at 4s. . . . . | 300  | 0  | 0  |
| Oats, 40 acres, average 30bush., at 3s. . . . .           | 180  | 0  | 0  |
| Six cows . . . . .  | 75   | 0  | 0  |
| 20 pigs . . . . .   | 40   | 0  | 0  |
| 100 sheep . . . . .                                       | 100  | 0  | 0  |
| Poultry . . . . .   | 25   | 0  | 0  |
|   | £720 | 0  | 0  |
| Expenses . . . . .  | 135  | 12 | 6  |
| Balance . . . . .   | £584 | 7  | 6  |

The working costs of the farm would be made up as under:—

|  | £    | s. | d. |
|--|------|----|----|
| Fertilizers, at £4 10s. per ton . . . . .            | 22   | 10 | 0  |
| Seed wheat, 125bush. at 4s. 6d. per bushel . . . . . | 28   | 2  | 6  |
| Labor, one man, five weeks, at £3 per week . . . . . | 15   | 0  | 0  |
| Rent of land . . . . .                               | 45   | 0  | 0  |
| Contingencies . . . . .                              | 25   | 0  | 0  |
|  | £135 | 12 | 6  |

The returns from a three years' system of rotation could be considerably increased if the stock were supplied with artificial food. The farmer could do most of the work himself, and would only need assistance during harvesting operations." Mr. W. H. Neale, in the course of his paper on "Stock-raising," said a farmer should always keep three or four brood mares, and breed the horses necessary for the working of the farm. By selling some of the aged horses he should be able to show an income of £30 per year on the horses. On a farm of 300 acres five cows could be easily kept, which should bring in a profit of £72 annually; 150 ewes would find sufficient feed on a holding of that size, and one could reckon on them bringing in about £1 10s. per head with wool and lambs. Last year he had kept 40 hens, and they had returned a net profit of £15 5s. Although he had had very little experience in pig keeping, he was convinced that they could be relied upon to return a good income for the small amount of work that they involved.

## YORKE PENINSULA DISTRICT. (TO BUTE.)

ARTHURTON (Average annual rainfall, 16in. to 17in.).

March 14th.—Present: six members.

**JIBBING HORSES.**—The meeting was held at Mr. J. H. Colliver's residence, when the Hon. Secretary, Mr. W. R. Stephenson, contributed a paper on this subject. He said there were few things more aggravating than a horse that was capable of doing its work, but refused. Most young horses, if properly handled, worked freely enough at first, but overloading and over-driving were responsible for the ruin of many horses. After he had been handled and properly mouthed the colt should not be worked more than two hours to begin with, and the time gradually extended. Very often the fault of a horse refusing to work was due to a bad-fitting collar, and more frequently through not being groomed properly. It was unreasonable to expect a young horse to work if it had sore shoulders. Care should be exercised in breeding, for, as a general rule, an unreliable mare would transmit the evil to its progeny. The Chairman, Mr. J. Welch, said a collar could not be too hard. He had known steel collars to be far more suitable for some horses than the ordinary collar. Mr. Klein said bad shoulders were very often due to neglect on the part of the farmer to groom the horses. Mr. Staples said too much work with heavy implements was the cause of a horse jibbing; the young animal had all its life taken out of it by having to work beyond its strength. An extra horse would save a great deal of trouble. The opinion of Mr. T. H. Howlett was that careful handling had a great deal to do with the making of a good worker. Mr. Colliver had some experience with unreliable horses. Good treatment was the best cure, the driver should be patient and kind, and not use the whip too freely.

BUTE (Average annual rainfall, 15.42in.).

February 12th.—Present: 14 members.

**CAN THE FARMER PRODUCE MORE ON THE FARM?**—Under this title the following paper was contributed by Mr. A. E. Bryant:—"With the increased cost of labor, taxes, and the almost prohibitive price of some of the machinery at the present time," he said, "it had become essential that each farmer should produce as much from his land as he possibly could. Practically the whole of that district was devoted solely to the growing of wheat, but sheep, pigs, cattle, and

poultry could all be kept on the farms as side lines. Sheep could be well and profitably bred on much of the land while it was lying idle. The land also benefited in no small degree when sheep were grazing on it, for the droppings helped to strengthen the soil, and fallow land was kept much cleaner. There was, moreover, the advantage that one had his own mutton to kill, and the lambs were also a good source of revenue. Wool, at the present prices, added another item to the benefits derived from keeping sheep. In regard to cattle, if the farmer kept the right breed, they were always profitable. He thought some of the farmers did not give enough attention to that matter, and kept on breeding in, instead of patronizing a good bull and keeping their cows at a high standard. In the matter of pigs, he was not in favor of keeping too many, but just enough each year for home use. As for poultry, the farmer should go in for good layers and table birds, as both paid well. Draught horses he did not class as a side line, as one could not work the farm without them. At the same time, he was strongly in favor of breeding the very best, as they would pay handsomely, and there was always a good market for them. He preferred the Clydesdale, because they were very active, and not too large for general farm work." In the discussion that followed, Mr. L. McCormack thought that the dairying industry was only in its infancy. He considered the income from a good cow about £25 per annum. Cattle and sheep had for years been looked upon as a side line on a farm, and were undoubtedly the best. The cow was the means of keeping the house in milk and butter, besides the production of a calf. He considered that wheat-growing alone was not a paying concern at present.

#### MAITLAND (Average annual rainfall, 20.08in.).

March 3rd.—Present: eight members.

**SHEEP-DIPPING.**—Mr. Smith tendered the following report of the dipping of his flock of about 1,200 sheep—the operation took less than one day. One man stood on each side of the dip with a pole, and submerged each sheep as it swam through the dip. Each sheep was allowed to stand in a draining pen, sufficiently long to allow most of the mixture to go back into the dip. He considered that the crush pen, situated at the front end of the dip, should be laid down with a grate to prevent the sheep from carrying dust and dirt into the hath. It was not wise to dip the ewes when nearing lambing time. They should be dipped soon after shearing or later on in the year. Mr. Smith also tabled a sample of wheat that had been enclosed in a tin with the lid on for four years. The sample was badly affected with weevil.

#### MINLATON (Average annual rainfall, 17.41in.).

February 22nd.—Present: six members.

**BULK STORAGE OF GRAIN.**—Mr. W. Correll read a short paper on this subject in which he advocated loose storage and mentioned that an old stripper could be used as a means of elevating the grain into a shed, by removing the back portion of the machine and putting wide bars on the beaters with a hopper over them. The machine could then be harnessed to an engine, and the grain stored in the barn. Members discussed the paper at length, and were agreed that some better method of storing grain was very badly needed.

### WESTERN DISTRICT.

GOODE (Average annual rainfall, 12in. to 13in.).

March 8th.—Present: nine members and four visitors.

The meeting took the form of a discussion on the question: "Does it pay to fallow land in this district?" Members were divided in their opinions, as no records had been kept. It was decided that during the coming season each member of the Branch should undertake to fallow at least 20 acres of land, and keep records, which would be submitted to the Branch.

# MILTALIE (Average annual rainfall, 14.55in.).

February 22nd.—Present: 14 members and five visitors.

SEEDING OPERATIONS.—A short paper dealing with this question was contributed by Mr. P. J. McEachen. It was a good plan, he said, to follow a crop of wheat by sowing oats to be cut for hay. Should they be broadcasted the quantity of seed would need to be increased by at least half a bushel. A spring-tooth cultivator run over the land would be all that was needed to cover the seed. On account of the shortage of labor he considered that large implements should be used in order that as much work as possible should be done during suitable weather. Such an implement as an eight-horse spring-tooth cultivator worked over the land twice would give better results than the same operation performed once by the plough, especially where the weeds were at all troublesome. He did not think it advisable to sow wheat before rain unless it was on new land. All seed should be graded and pickled before sowing. He had found the best method of pickling the grain was to empty the seed on to a cement floor and mix the solution with the wheat by turning the grain over. In the discussion that followed the Hon. Secretary (Mr. W. E. Hie) said if the ground was loose, a good harrowing would be better, as the oats would not be buried too deeply. He favored pickling the wheat in a cask. Mr. E. Story said one should always endeavor to sow oats, as they made a good hay crop, and were also good feed for all classes of stock. Messrs. J. P. Story, P. Bagnell, J. S. Jacobs, and L. Augner also spoke.

# O'LOUGHLIN.

February 27th.—Present: seven members and three visitors.

WHEAT STANDARDS.—The inaugural meeting of the O'Loughlin Branch of the Agricultural Bureau was held at the residence of Mr. E. O. Dahl, when a paper on the question of "Wheat Standards" was contributed by the Hon. Secretary (Mr. E. O. Dahl). He was of the opinion that one standard for each year's wheat did not meet the altered circumstances ruling at the present time. He thought there should be a high standard to meet first quality wheat, a second standard for wheat that was badly cleaned, and a third for poorly developed and inferior grain. Under the present conditions the farmer who delivered a load of badly-cleaned wheat obtained just the same price as the farmer who had taken the trouble to clean his wheat properly and deliver a good sample to the agent. Mr. Lutz in discussing the paper, thought that the sample would be considerably improved if more than one standard were made. The farmer who neglected to clean his wheat properly would soon exercise more care in the harvesting operations if his wheat was classed under the third standard, and docked from 4d. to 5d. per bushel. Mr. Bergmann thought the good name and high quality of Australian wheat was becoming tarnished, and the fault was in no small way due to the badly-cleaned grain that was marketed each year. The Hon. Secretary also pointed out to members the advisability of only sowing the best grain. He admitted that there were times when inferior seed gave fair returns, but if a dry spell of weather, or a frost was experienced, the quality of the seed sown would almost invariably produce an inferior sample.

# YEELANNA.

February 23rd.—Present: 17 members and four visitors.

STRIPPER VERSUS HARVESTER.—Mr. C. Wagner, in a short paper on this subject, said he favored the use of the stripper in the mallee country. There were very few parts on the stripper that wore out quickly, and a man with a machine cutting 5ft. 6in. was able to reap 10 acres to 12 acres a day. A 7bush. or 8bush. crop reaped with the stripper and cleaned with the winnower would turn out a real good sample; but if the harvester was worked in the same crop it would have to be driven too quickly to turn out a good sample, and by so doing one would be almost certain to blow a good deal of the wheat out of the machine. A good discussion followed, the majority of members being in favor of the stripper.

KOONIBBA, February 29th.—A special meeting was held, when the election of officers took place.

YANINEE, March 2nd.—An interesting and instructive paper, under the title of "The Care and Management of the Horse," was read by Mr. L. Hicks.

### EASTERN DISTRICT. (EAST OF MOUNT LOFTY RANGES.)

#### HALIDON.

February 27th.—Present: 15 members and five visitors.

**HARVEST REPORTS.**—Members discussed the results of the harvest. Various reasons were given for the prevalence of white heads, but the general feeling was that they were caused by a dry spell and hot winds when the wheat was in the flowering stages. Evidence of "take-all" was also commented upon, and members were advised to fallow more land, and to sow larger quantities of oats. Rust was also given as the cause of some of the low yields, late Gluyas especially being affected. Gluyas had proved to be the heaviest yielder for the district, 25bush. to the acre having been recorded. Members were divided in their opinions as to whether early or late sown wheats gave the best results.

#### MINDARIE.

March 11th.—Present: six members.

**HARVEST REPORTS.**—The following is the report tendered by Mr. Payne on the results of last harvest:—Yandilla King, 18bush.; Federation, 18bush.; Marshall's, 20bush.; Walker's Wouder, 12bush. The above were all sown in June with 45lbs. of seed and 70lbs. of super. to the acre. Mr. Hamel also reported as follows:—Unification, sown on new land with 45lbs. of seed and 40lbs. of super., average 6bush. Mr. Hamel remarked that this wheat was extremely tough to reap. Members were of the opinion that if the stubble was burnt off, the growth of thistles during the next year would be checked considerably. Mr. McCabe said that if the fallow was turned back during the summer months it would materially assist in eradicating weeds.

#### NETHERTON.

February 22nd.—Present: nine members.

**IMPROVING THE STRIPPER FOR REAPING LIGHT CROPS.**—In the course of a short paper on this subject, Mr. Peake said, owing to the scarcity of labor, there was a tendency among farmers to purchase larger machinery. He suggested that the wheat box should be placed directly behind the horses, on two wheels, about 6ft. apart, with the steering wheel well forward in the centre of the machine. The comb and beaters could be small and light, and independent of the other portion, but, of course, attached in a suitable way at the rear end, and supported by another wheel at the other end. The wheat could be elevated up to the top of the box and then dropped through a suitable thresher. The wheat box would be much higher than at present, with the bottom sloping outwards, and the door made on the side of the machine. That would overcome the difficulty now experienced with machines in getting close alongside the heaps. In order to work the comb, he would place a gear at each end that would be connected by a rod, in order that the comb might be kept level. The beaters would, no doubt, need to be in sections, with two bearings placed in the centre a few inches apart. The spindle would also be in two pieces, with a movable union joint, as there was always a difficulty in getting three bearings on one shaft to run true.

#### NUNKERI AND YURGO.

March 3rd.—Present: seven members and visitors.

**SEEDING OPERATIONS.**—The meeting was held at Mr. S. C. Kelly's residence, when the following paper on "Seeding Operations" was contributed by Mr. S. C. Kelly. The land, if very dirty, he said, should be worked with a plough, with the mould-boards taken off, as that would make a better job of destroying the weeds. If the soil was of a heavy nature the seed should be sown about 2in. deep; but if one was working on sandy land he thought it would be better to sow fairly shallow. If oats were sown, 40lbs. of seed to the acre would be sufficient, especially if drilled in about March. If sown later more seed should be used, because it did not stool out so well. Land that was sown for a hay crop should

be rolled. When stubble land was being prepared before seeding, it was not advisable to plough more than 2in. deep or there would be a danger of stirring up the sour soil. He did not think it a good plan to work stubble land unless a clean buru was secured. To pickle seed wheat, a cask should be sunk to the level of the ground, and 1lb. of bluestone dissolved in each 10galls. of water. A block and tackle could be used to haul the wheat in and out of the cask.

#### RAMCO.

December 17th.

THE GORDO VINE.—The following particulars were given by Mr. F. Lewis in a paper under the above heading:—The average yield of raisins in that district from the Muscat Gordo Blanco vine was about  $1\frac{1}{2}$  tons per acre, ranging from less than 1 ton up to 3 tons. He was of the opinion that the same conditions, with a normal season, and no serious setback, such as very hot winds, diseases, &c., that yields should reach 3 tons, or even higher. To do that the vines would require a good deal more attention than they received at present, more manure and cultivation and better pruning and training. In his opinion the latter was the most important, especially on new areas. In planting a mixed block it was a good plan to test the ground beforehand for depth of soil, and make it a rule, as far as possible, to plant the citrus in the deepest soil, the deciduous next, and the vines in the shallowest soil, but that should not be less than 18in. of soil over the limestone, or it would interfere with ploughing, &c. Vines did better, as a rule, in that district on limestone country than in very deep sand, and, although trees would grow rapidly and well in the same ground for a few years, they soon deteriorated. That was accounted for by the fact that the small roots of the vine would penetrate the cracks and crevices of the rock and spread sideways until they became quite flat without losing their vitality, whereas the roots of most trees did not have that power of spreading, and would gradually choke and starve. The Gordo could be profitably grown on a western or southern slope, or in a valley where it would not be safe to plant Sultanias on account of frost, which very rarely affected the Gordo; but it was necessary to have them located where they could be watered liberally, and protected from hot winds. Unlike the currant, the Gordo required at least as much water as trees to obtain the best results. All levels should be taken, and the land carefully graded, and an irrigation trial performed before planting. Most growers, when planting, procured their cuttings or rooted vines wherever they were cheapest, without troubling about what stock they came from. He considered that a great mistake. When a man intended buying livestock for stud purposes one of the first things he inquired about was the pedigree, and a good nurseryman did the same, yet many people who had to make a livelihood out of vine-growing would often plant vines grown from suckers, diseased wood, or "foreigners," and the mistake probably was not noticed for years. The best plan was to secure cuttings from vines personally inspected during the previous season. Three cuttings for each vine would be needed. A cutting planted as a permanent vine would usually make a better growth than a rooted vine planted out from the nursery, but it would require more irrigation than the rooted vine for the first year. The usual thing was to put in two cuttings, and pull out the weaker of the two the following winter. At the same time an equal quantity of cuttings should be put in a small bed where they could have any amount of water. Cuttings planted out in the permanent positions may take a year longer to come into bearing, other things being equal; but, as previously mentioned, they made the best vines. When planting rooted vines all damaged roots should be cut out, but as many small fine roots as possible preserved. The tops should be cut back to the strongest shoot, to 2in. or 3in. long, and all dead wood removed. In his opinion the best system of training the Gordo in that district was on a single wire trellis about 18in. high. That would be high enough to keep the grapes off the ground and allow room for working the horse hoe under the vines, and at the same time low enough to prevent the limbs from drooping and exposing the grapes to the hot sun. He would have the rows 10ft. apart and the vines 8ft. apart in the row. They should have a clean, straight stem, and be free from wounds, up to or a little above the wire, where they should fork, with an abrupt bend either way along the wire. Both arms should be as near as possible the same size and vitality when full grown. To obtain that



result it required a lot of attention and careful treatment the first few years, and he advocated trellising as early as possible, the first year after planting for preference, as the wire would give the young vine protection from cultivating machinery and stock, and also a support for a vigorous vine to cling to in an upright position. The first year they would require frequent suckering, and should be gone over about half a dozen times during spring and early summer, and all shoots below ground level rubbed off. That was essential, as all sucker shoots left for winter pruning made unnecessary wounds, and was the cause of frequent suckers growing from the same place for years. Suckering was much easier and quicker to do in spring, when the shoots were tender, than in winter, when they had to be dug out and carefully cut with the secateurs. The first year's pruning consisted of cutting back closely and cleanly all shoots, except the strongest, and reducing that to two or three buds if the vine was weak, and bringing it straight up to the wire if vigorous, and, of course, cutting out all dead wood. It was better to cut back fairly hard the first few years to shape the vine; but not hard enough to force too many suckers. The second year they should be strong enough to take a rod one way along the wire a foot or two, in the direction away from the prevailing wind for preference, and that should be given a long twist round the wire and tied securely at the end to keep it in place. To do that it was best to destroy the end bud by cutting out and tying with string or binder twine just behind the destroyed bud. If the rod was tied behind a live bud the swelling of the wood caused the string to cut into it, and leave a weak place, which was liable to break or 'choke' later on. During the third year the permanent arm should be extended a foot, care being taken to cut out all dead wood. Spur prune all lateral shoots to two eyes and a base bud, and if there was a good rod in the right position, start a short, permanent arm in the opposite direction along the wire, treating as before. All growth below the crown should be cut out. Care must be taken to untwist last year's wood. Lay the arm along the top of the wire and the lateral spurs would keep it in position, but the end of the new rod might not do as before. Subsequent pruning consisted of extending the two main arms a little each year until they meet that of the next vine, and pruning the spurs in most cases by cutting out the outside shoot with the pieces of last year's dead wood attached, and cutting back the inside shoot to two eyes and a base bud. Of course that could not be done in every case on account of weak growth or accident; but if that rule was followed as closely as possible the spurs would never grow lanky and unsightly. When full grown the vines should present a straight, even appearance after pruning, when looking along the row, with no spurs sticking out beyond the width of an ordinary trellis post. The fruit-bearing spurs should be evenly distributed all along the wire without any vacant places, and, viewed from the side, they should be straight and even, with an upright stem, and appear to be rigid and self supporting."

**DRYING OF FRUIT.**—A discussion on this subject was initiated by Mr. Dunning, who said that the present system of grading gave a premium to the man who was slovenly and not conscientious. The man who sends fruit to the shed only sufficiently dried to pass muster gained in cash. He would suggest introducing some appliance, such as used for testing moisture in wool, so that one could say that the fruit was properly dried. We were producing too much for home consumption, and there must be an export to compete with the world's markets. The fruit must be in the best condition, and much of the river stuff was not first class. The question was how to make the conscientious man fare as well as the careless. With bulk grading it was necessary to mix fruit to get it through the machine. He saw three eweats weigh 350lbs., and another lot weigh 550lbs. The first was better fruit, yet 200lbs. at 4d. per pound gave the latter an advantage of £3—a premium to the careless producer. In the discussion it was generally agreed that inspectors or shed managers were needed who would refuse to handle insufficiently dried fruit.

**BRINKLEY, February 23rd.**—This being the first meeting since the harvest recess, members discussed various topics of local interest.

**MONARTO SOUTH, February 23rd.**—Mr. R. Hein delivered a lecture dealing with a trip up the River Murray to Nildottie, and returning by rail via Karoonda, Tailem Bend, and Murray Bridge.

## SOUTH AND HILLS DISTRICT.

### ASHBOURNE.

February 25th.—Present: 18 members and four visitors.

An address was delivered by the Dairy Expert (Mr. P. H. Suter) on "Dairying." A meeting during the afternoon was also held at Messrs. Meyer & Kirkham's dairy, when Mr. Suter dealt with the "Minor Ailments and Remedies for Dairy Cows." A further special meeting was held on March 4th, when the Inspector of Orchards (Mr. C. H. Beaumont), in company with members of the Bureau, visited the orchards in the district, and gave a lecture on "The Planting and Care of the Orchard." The lecturer also gave a demonstration of apple-packing.

### BLACKHEATH.

February 23rd.—Present: 11 members and five visitors.

CARE OF HARNESS.—Under this heading a paper was contributed by Mr. R. Talbot, in the course of which he said the harness should first of all be washed in warm water with soft soap in order that all dirt, sweat, &c., might be removed, and then allowed to dry in the sun. He preferred a polish that would not come off on the hands. When not in use the harness should be hung up in a cool, sheltered place. He advocated the use of leather-lined collars, but did not think it advisable to use them on horses that had sore shoulders. The collars should not be dipped in water, but rubbed over with a warm, damp rag, and finally dressed with neatsfoot oil to soften the leather. The leather on the traces adjoining the buckles did not take long to wear out or crack, and in order that that might be prevented an additional small piece of leather should be placed on the inside of the buckle. The nickel on the buckles, &c., could be prevented from becoming rusty by using a polish prepared for that purpose. If possible, the use of rivets should be avoided when repairing harness, as they tended to weaken it.

### CLARENDON (Average annual rainfall, 33.67in.).

January 23rd.—Present: nine members.

THE WATTLE INDUSTRY.—The broad-leaf wattle industry of South Australia, said the Hon. Secretary (Mr. T. Brooks), in a paper dealing with the wattle industry, was one which was worth from £2,000 to £3,000 annually to that district. With proper care and attention he was convinced that the industry could be increased until it would represent £10,000 to the settlers situated in that locality. When one considered that the wattle could be grown on land that was unfit for producing anything else, the very fact of one being able to utilize waste land should impress upon settlers the importance of producing from the land every available source of revenue. The importation of wattle bark from South Africa was one of the main causes of the low prices that had been ruling during some of the seasons they had recently experienced. Since then, however, a Wattle Growers' Association had been formed, the objects of which were to study the interests of the growers and the protection of the industry. The association had done good work, with the result that prices had risen until the wattle industry had become a good paying proposition. Mr. J. Spencer, one of the life members of the Clarendon Branch of the Agricultural Bureau, was President of the Association, and it was mainly through his efforts that a branch of the Wattle Growers' Association had been established at Clarendon. He thought if the Branches of the Agricultural Bureau situated in those districts where the wattle could be grown were to take the matter up, much of the so-called "waste land" could be utilized, and the production of wattle bark would be increased three-fold. He concluded that it was to the interest of every producer of wattle bark in the district to become a member of the association.

### GUMERACHA (Average annual rainfall, 33.30in.).

December 24th.—Present: six members.

IRRIGATION.—In a paper under this heading, Mr. C. Jamieson said two things at least were necessary if one wished to obtain good results from irrigation, namely:—Land of reasonable quality and a fair knowledge of the fundamental

principles of irrigation. The land should not be too stiff, a little on the light side would give best results, with soil well drained, and of a good depth. He strongly pointed out the advisability of having the water tested before installing an irrigation plant. The best method of applying the water, although an expensive one, was by the aid of sprinklers, as the water was evenly distributed over the land. Potatoes were the chief crop irrigated in that district, and it was important that the land should be thoroughly worked before planting. Tomatoes could be irrigated, but under ordinary conditions very little water was required. Maize and sorghum also did well under irrigation. A very good method of sowing was to plant two rows close together, and then leave enough space between the rows to work a horse hoe. The mistake of not hoeing the land was frequently made. He considered that one hoeing and one application of water, when the land was fit, would give better results than just the bare watering. He had put a bank across the land every few feet in order to make the water go into the land, and besides saving a good deal of labor, he had found it most beneficial.

#### HARTLEY (Average annual rainfall, 15in. to 16in.).

February 20th.—Present: 12 members.

**HARVESTER VERSUS STRIPPER.**—The following short paper dealing with this subject was contributed by Mr. H. Cross. Although that was a subject that was constantly being discussed by various Branches of the Agricultural Bureau, he said, it was still hard to convince some agriculturists that there was a greater advantage to be obtained by using the harvester. He considered that the outstanding feature in favor of the harvester was the great amount of labor that could be saved if one of these machines was employed in reaping the crop. Being close to the stacks, a farmer using a harvester could, on cool days, cart his wheat into the station, while the man using the stripper would in all probability have nothing to do. He was of the opinion that if the grain were carted and stored into the barns until after seeding, the gain in weight would more than repay the farmer for his trouble. The farmer using a stripper very often argued that he used a stripper because he was able to save the cocky chaff. He pointed out that in many cases one could notice heaps of cocky chaff in the paddocks that were quite unweeded for, and would therefore be useless as food for stock. The cocky chaff was principally used for feeding cows, and the farmer was in the habit of adding ingredients to it that would probably bring the price of it up to that of bay chaff.—A good discussion followed, some members being of the opinion that the speaker under estimated the value of cocky chaff.—The report of the experimental plots conducted by Messrs. T. Burns and F. Leumann was discussed.

#### INMAN VALLEY (Average annual rainfall, 26in. to 27in.).

February 27th.—Present: eight members and one visitor.

**THE CARE AND TRAINING OF HORSES.**—In a paper dealing with this question Mr. R. J. Martin said he would first deal with the treatment of the foal. He pointed out how often one noticed a foal running behind its mother, who was working in a sulky or spring dray, until its feet became quite tender and sore. If the mare must help in the daily routine of farm labor, then the proper place for the foal should be in a loose box, where it could not injure itself. Of course, a much better plan was to have the mare and foal in a paddock where they would be undisturbed. He did not think it was advisable to overwork the mother, because the milk became overheated, and would very likely injure the foal's stomach. The foal should be allowed to run with the mare for about six months, when it could be gradually weaned by being given small feeds of chaff, bran, crushed oats, &c. From experience he had proved that if the foal was occasionally handled during the early stages of its life very little difficulty would be found when it was being broken in. He had found it a good plan to put the colt in the pole of the trolly alongside steady horses in order that he might become accustomed to feel the weight of the collar. It naturally followed that when the colt commenced hard work he would want feed with plenty of strength in it. If raw or crushed oats were used bran should be added; that mixed with good chaff would keep a horse well up to his work. Rather than give the horses large feeds, when more food was wasted than eaten, one should endeavor to make the feeds smaller, and at more frequent intervals. A little salt mixed with the chaff would give the horses a much better appearance, as it helped to make their coats glossy. It was well to avoid putting horses in paddocks which

were sandy and in which the feed was short. A good quantity of green feed would help to shift sand in any horses that were affected. The point as to what was the correct time to water the horses was one on which various opinions were always expressed. He did not think one could do better than allow them to have a drink whenever they wished to do so. In dealing with the question of grooming he pointed out that if one did not have time to go over the whole of the body of the animal the shoulders should be thoroughly cleaned. During the winter a waterproof rug would keep the coat soft and the horse warm.

KANMANTOO (Average annual rainfall, 17.90in.).

February 23rd.—Present: eight members and one visitor.

RABBITS.—Under this heading a paper was contributed by Mr. W. C. Mills. He was of the opinion that if one wished to cope with this serious pest it was necessary that one should have a fair insight into the life history and habits of the rabbit. At that period of the year when the first green grass appeared the rabbits paired off and commenced breeding, usually in a soft piece of land, or amongst some other kind of natural cover. The first litter would appear from three to five weeks after mating, and thereafter about once during each month until the green feed disappeared. Poisoning, fumigating, trapping, and digging out were the methods usually employed in that district for the destruction of the rabbits. He had tried each of these methods, but none had been wholly successful. Some people were of the opinion that the rabbit should not be destroyed indiscriminately because it could be used as a food for human consumption. To those people he would point out that it was generally recognised that four or five rabbits would eat as much food as one sheep. At the present time each sheep was worth about 15s. annually to its owner. From that it should be seen the enormous amount of damage the rabbits did to the sheep and pastoral industry of the State. During the late summer and early autumn every effort should be made to poison and destroy the rabbits. During the first two or three weeks following the early rains there would only be a few rabbits in each burrow, so every endeavor to trap the rabbits at that time should be made. If the young rabbits appeared before all the old ones had been caught the burrow should be fumigated. Digging out should only be undertaken when the ground was damp. Best results would be obtained if the rabbits were killed first, and holes dug out afterwards. In clear, open country, where there was no other cover except the burrows, the holes could then, of course, be attended to without delay. Again, some people thought that if they started to kill after their neighbors had finished they would drive the rabbits back on to the land that had already been cleared. He suggested that killing should commence on a certain day, and an inspection made shortly after. Action could then be taken against those farmers who had neglected to help in the destruction of this pest. An interesting discussion then followed.

MOUNT BARKER (Average annual rainfall, 30.93in.).

February 20th.—Present: 48 members.

MERINO SHEEP.—Mr. S. Shepherd, in a paper under this heading, said any person visiting the various markets could not help noticing the number of poorly-bred Merino sheep offered for sale. No doubt the demand for sheep and the fact that every available ewe was being put to the ram, whether of good breed or otherwise, had an ill effect on the quality of the sheep. To those farmers who wished to breed good Merino sheep, he suggested that they should purchase cast for age ewes from some good breeder's flock. When buying, the farmer should take 30 per cent. more than he required, for culling purposes, get the ewes in good condition, then yard them up on a fine day, and take plenty of time in going carefully through them. First mark all rejects, such as bad-shaped sheep, hollow backs, or high, narrow shoulder, or small sheep; also any that were very wrinkly or appeared sickly, then turn every ewe up and carefully examine her udder and teats. If a teat had been injured by being cut at shearing time, or any had very large teats, cull them, because their lambs would very likely die and the ewe get milk fever and die also, or cast her wool. To breed a good even lot of Merino sheep the first aim should be to get the ewes as near to one type and size as possible. In examining the wool any sheep with the following defects should be culled:—Any strong or hairy breeched ewes, those that showed a cross fibre or hairy growth cropping up above the tip of the main fleece, also extremely fine or short-stapled wool, should be rejected. If the flock had been well classed there would not be so much trouble

later on when classing the wool. It was impossible to breed an even type of sheep if rams of an indifferent class were employed. When selecting the rams, large-framed sheep should be chosen, with strong bone, straight backs, short necks, broad shoulders, and the body free from wrinkles or folds. They should also have clean faces. The next item of importance was the fleece. He preferred wool of a medium strength with a good even fleece, showing the same character over the whole of the body. At the same time one should endeavor to secure a fair length of staple and density, but it should be borne in mind if the wool was bred too close the staple would become too short, and if the staple were allowed to become too long the wool would be very thin and loose. In the discussion that followed, Mr. B. Stephenson referred to the ewe with the large udder and large teats—a class of ewe which he considered should be culled out, as the lamb could not get the teat in its mouth, and would suck at a small piece of wool until it died. The large udder did not occur so much in crossbreds as in other classes of sheep. The cause of some sheep getting white wool along the back was standing under a tree in wet weather, and getting the constant drip of rainwater on one spot, as it was more prevalent in wet weather. Breeders were now aiming at breeding big sheep without wrinkles. Mr. H. Jones said it was only necessary to go into the saleyards to see the poor quality of the sheep. After their experiences during the drought he thought they would have got rid of their poor quality sheep. Mr. Monfries said they had evidence of the class of sheep which Mr. Shepherd bred when they recalled the fact that he (Mr. Shepherd) had obtained 500 guineas for a ram, which showed that he knew something about the game. He pointed out that the reason of poor quality sheep being seen in the markets was owing to the fact that at times only culls came into the markets, as breeders would not bring their best sheep into the saleyards. He was pleased that Mr. Shepherd barred the wrinkled sheep. Mr. L. Rankine, in referring to fat lambs for export, said he believed the best lambs for export were obtained by black-nosed rams—Shropshire or Southdown—from big Comeback ewes. Mr. Monfries agreed with Mr. Rankine's views. He contended, however, that a man should not breed for export only, but aim at getting a general utility sheep as well.

#### MOUNT BARKER (Average annual rainfall, 30.93in.).

March 27th.—Present: 50 members and four visitors.

**WHITE LEGHORNS FROM CHICK TO PULLET.**—In the course of a paper dealing with this question, Mr. E. W. Beythien said:—"Success in egg-farming mainly hinges on a man's ability to raise strong, healthy chicks from shell to laying age, or, in other words, the first five or six months of a pullet's life. Because of the fact that no financial returns can be expected during this period there is a natural tendency to neglect chicks, the result being a survival of the fittest, and even those that do survive are in a good many cases only stunted runts or weaklings, which are of very little value as egg producers. A chicken, unless well nourished with easily digested food, and every attention given to its bodily warmth or comfort cannot be expected to develop into a robust egg-producing pullet. The treatment during the first six months of a bird's life either makes or mars it as a profit earner for all time, as all chicks hatched from eggs of well-mated, vigorous parent stock come into this life as well developed and fitted for the stern battle before them. But fed improperly or kept in stuffy, dirty brooders at unsuitable temperatures or through being unfortunate enough to have weak parents on one or both sides, the reverse conditions can only be expected. It seems to me that in laying out a poultry plant at least half the money available for expenditure could well be spent in brooder houses and accommodation for the growing stock, for a pullet well nourished and well grown will stand an astonishing amount of neglect and hardship during the rest of its life, and still be bright and profitable. Once in the brooders it is not a difficult matter to raise young chicks successfully; but on no account should food be given before they are at least 48 hours old, and as a precaution against this it is better not to remove them from the incubator nursery until the twenty-third day. After this, however, any food—chick grain mixture—may be fed sparingly in a little chaff or sand four or five times a day. Finely crushed, sharp grit, with little charcoal and cool, clean water, must be always before them. When a week old moist, crumbly mash mixed with skim milk, and containing also a little meat and bone meal, should be fed twice daily, in addition to the scratch grain mixture, and finely-chopped tender greenstuff should be fed regularly. Chicks

should be brought up on abundance of greenstuff, as they will eat more of it when adult fowls, and thereby save nearly half the food bill. Over feeding in the day time should be avoided, as it tends to make chicks sluggish, and gets them into the habit of moping round the hover from one feeding time to another, instead of which they should be kept actively scratching all day in order to develop sturdy frames and vitality, and being so much in the fresh air they are certainly healthier and not so liable to bowel trouble. In chicks, bred from healthy vigorous stock that is mature, bowel trouble arises mostly from overfeeding, combined with the close, stuffy air of a badly ventilated brooder, or through chills caused whilst wet and exposed to cold, bleak winds in badly sheltered runs. With either of these causes bowel trouble results, and then comes the clogging of the vent and wasting, if not the death of the chick. Brooding chicks is an art no careless person can ever learn, and numbers of good pullets are ruined each year through faulty brooding. The temperature under the hover should at all times be high enough to prevent overcrowding, and at the same time the hover should be well ventilated in order to keep the air pure and fresh. However, the sooner chicks can be made to do without artificial heat the better, as after a certain age it tends to weaken and lower the vitality. They should be gradually hardened off by reducing temperature under hover from time to time. After the first month free range should be allowed the growing stock, as they thrive much better under such conditions. The cockerels should be culled out, and the pullets themselves should not receive addition to their scratch grain feed, the ordinary laying ration of adult stock. I am a firm believer in this, because besides developing the frame of the bird, I think the egg-laying organs should also be developed in the growing pullet. Then when the laying age is reached the bird is in perfect condition throughout, and ready for its life work. It will be noticed that in some strains the laying age is reached much earlier than in others; but whenever it arrives never do, on any account, such an unnatural thing as to try and check egg production. A setback of this sort can only be more or less injurious. If a pullet bred from sound, mature stock wants to lay at from four and a half to five months let her lay. The eggs at this stage are so small that they can do her no harm, and it is only the natural outlet for her surplus vitality. It will be found that after laying a dozen or so eggs she will ease up on her own accord, and take a short rest, and then start afresh with normal sized eggs, whilst others of the stock are just beginning to think about work. The early layer is the bird with vitality, and a natural born tendency for egg production, and as such should be legbanded and kept under observation during the first year to make sure that in other respects she comes up to standard for the breeding pens; but at all times the parent stock must be sound, vigorous, and correctly mated with generations of breeding behind. Maturity is absolutely essential. Mash should always be fed to growing pullets in the evening, and they should be encouraged then to distend their crops to the fullest extent. This causes them to grow up with a big stowaway. This is necessary, for a bird must be a big eater to be a heavy layer. Regarding the time for hatching pullets to obtain best results, certainly locality, climate conditions, and season play a great part; but the records from the following test carried out by me may prove interesting. All pullets were hatched from eggs of same parent stock:—Twenty-five pullets, hatched August 1st, 1914; laid four-five months; average per bird, first year 227, second year 184, third year 189. Thirty pullets, hatched September 1st; laid at five-six months; average per bird, first year 206, second year 187, third year 178. Thirty pullets, hatched October 1st; laid at six-seven months; average per bird, first year 198, second year 168, third year no record. Twenty pullets, hatched November 1st; laid at seven-eight months; average per bird, first year 164, second year 157, third year no record. Forty-five autumn pullets, hatched April 1st, 1915; laid at five-six months; average per bird, first year 93, second year 159, third year no record.

CHERRY GARDENS, February 26th.—Mr. E. Ashby, of the Blackwood Branch of the Agricultural Bureau, delivered an address on "Australian Insectivorous Birds" to a large number of members and visitors.

INMAN VALLEY, March 13th.—The Government Veterinary Lecturer (Mr. F. E. Place) gave a demonstration and lecture on "Worms in Sheep and Preventive Measures" to a large attendance of members and visitors.

MACGILLIVRAY, February 19th.—Mr. R. Wheaton read an extract from the *Journal of Agriculture* on "Stock on the Farm."

MORPHETT VALE, February 23rd.—The "Noxious Weeds" question and "Treatment of Injured Stock" were the subjects which formed the discussion of the evening.

MORPHETT VALE, March 23rd.—The meeting discussed at length the question of the installation of trucking facilities for stock at the local railway station.

STRATHALBYN, February 26th.—One of the members of the Branch gave an interesting account of a visit to Tasmania, dealing chiefly with agriculture and livestock.

## SOUTH-EAST DISTRICT.

### COONAWARRA.

February 26th.—Present: 19 members and two visitors.

SUCCESS IN DAIRY FARMING.—Mr. P. C. Stafford opened his remarks in a paper under this heading by stating that cleanliness was a factor too often overlooked in the production of dairy produce. The keeping quality of both milk and cream was greatly impaired by contamination with any form of dirt, and its market value was consequently greatly reduced. In either cheese or butter making the factory manager looked for milk and cream to reach him in a fresh, clean, and cool condition, in order that good marketable produce might be made therefrom. Milk or cream of inferior quality could not be made into good cheese or butter. The farmer who consistently supplied milk or cream to the consumer, retail merchant, or factory in good condition would always command a good price for his produce. His gain might not be more than from a halfpenny to a penny per gallon of milk or pound of butter fat, but even that would amount to a fair sum in the course of the year. The question of the minimum yield on which cows should be culled was one that every farmer should answer for himself. It was a matter of actual cash returns over the cost of production—what the return from each cow per year amounted to, and the cost of production. In the expenditure should be included the cost of grazing, cultivation, fodder purchased, calf food, labor, delivery of produce, and upkeep of farm plant. The net income would show the farmer the financial result. The testing of his herd would show which cows were bringing in a reasonable return, and those on which he was wasting time and money in keeping. One point, however, should be borne in mind by all, viz., that 500 galls. of milk or 260 lbs. of butter per cow per year could be obtained from the herd by systematic working, and therefore no dairy farmer should be satisfied with less. When that standard was reached, further progress would quickly follow. The most difficult part of herd-testing was to make a start; those who had not begun were always apt to persuade themselves that it was not necessary in their particular case; but they were surprised when they found how many poor cows the herd had been carrying. Owing to the gradual increase in the cost of labor that had taken place during recent years, and which was still going on, the profit from dairy farming under the no-testing method was speedily diminishing. On the other hand, where cows were regularly and systematically tested, and calves were raised from those tested cows mated with milking pedigree bulls, and the culling out of the poorest milkers was continually going on, the milk yield from the herd was gradually on the increase. Consequently, under systematic working, the higher price of labor did not, in the same measure, reduce the returns, as on those farms where the cows were not tested and carefully bred. Here, then, lay the solution of the labor difficulty on the dairy farm. The hours of working could not be increased, nor the feeding cost per cow be cut down, but the average production of the herd was subject to a substantial increase on every dairy farm by the combined system of testing, culling, and breeding on the right lines. Sooner or later that fact must be recognised, and the protracted delay meant money lost in consequence.

# GLENCOE (Average annual rainfall, 33.84in.).

November 29th.—Present: 11 members.

DESTRUCTION OF SORREL AND FERN.—A paper dealing with this subject was contributed by Mr. J. Riddoch. These weeds, he said, would be found to grow on the same class of soil and under the same climatic conditions. He would rather deal with sorrel than fern, for, as far as his knowledge went, fern was of no value whatever, therefore it should not be allowed to spread on valuable land that should be growing something more useful. He preferred the reaper and binder for taking off crops, because the harvester distributed a great many seeds on the land that would germinate during the next season. The wheat could then be graded from the thresher and all sorrel seed removed. Land badly affected with sorrel should be grazed bare with sheep that had been running on scrub land, as they would destroy a large number of the plants. The land should be disc ploughed in the summer time and left for a few weeks. He contended that the disc plough was better than a hoard plough, as it left the land more exposed to the rays of the sun. After harrowing it should be gone over with a spring-tooth harrow which would pull out the plants by the roots, then again ploughed and harrowed. Only constant and thorough cultivation would successfully eradicate the weeds. As a preventive he suggested using more lime on the land than they were in the habit of doing. He used it on a small scale, and found it very beneficial to the land, and also a means of clearing the land of this pest. In destroying ferns, he stated that some people thought one had only to plough the land and sow Algerian oats and the ferns would fail to come up. He advocated destroying the ferns beforehand, because when the oat crop was high enough to protect the young ferns from frost they came up and choked the crop. To cut the fern with a chopper or grass mower as soon as it appeared would encourage the growth of grass, and help to subdue that undesirable weed. The ferns should be left on the ground because they helped to rot the younger shoots; if burnt after cutting it would encourage new growth. A clover, preferably Subterranean, could be sown after the fern had become very thin, as it appeared to thrive well on our light soil, and he believed it would do equally well on land that had previously grown fern in large quantities. A lengthy discussion followed the reading of this paper in which members generally agreed with the remarks of the writer. Mr. F. A. Telfer exhibited a specimen of tape worm 12ft. long that had been taken from a lamb that had died that morning.

# KALANGADOO (Average annual rainfall, 33in. to 34in.).

March 9th.—Present: 12 members.

GRASSES SUITABLE FOR DISTRICT.—The meeting took the form of a discussion on this question. Mr. H. Mills said he had obtained good results from red clover. Messrs. Tucker and McKenzie preferred rye grass for the best lands, and black prairie grass for the sandy soils. Mr. Hemmings tabed a sample of Japanese cudso, with which he was experimenting. So far it had done very well.

# KI KI.

March 23rd.—Present: eight members and one visitor.

BEST WHEATS FOR DISTRICT.—The meeting took the form of a discussion on the above question. Members were of the opinion that Golden Drop and Gluyas were the best early wheats, and favored Marshall's No. 3 as a late variety.

# MILLICENT (Average annual rainfall, 29.25in.).

March 4th.—Present: 10 members.

CONTINUOUS CROPPING.—Mr. G. G. Serle gave an account of his experiences of continuous cropping. He stated that in 1912 he ploughed the land in February, cultivated it a couple of months later, and again just previous to seeding, when 14bush. of malting barley was sown with 70lbs. of super. per acre. The yield was 40bush. per acre. Next year he finished ploughing in February, cultivated twice, and sowed oats, which cut three tons of hay per acre. In 1904 he ploughed the same land in March, and had a return of 2½ tons of wheaten hay per acre. Oats were sown in 1915, and still the yield was three tons of hay per acre. In 1916 he sowed wheat, and the return was 30bush. per acre. This season he had a crop of



barley on the land, and it looked as well as any crop he had previously grown. Last year he had increased the manure to 100lbs. per acre. The land was black, sticky soil, but it did not harden, because it had been worked thoroughly. Good drainage had a very important bearing on cropping. Mr. J. Bell said he had occasionally cropped his land two or three years in succession, but had never obtained the good results reported by Mr. Serle. Mr. Serle continued by saying it was a mistake to think that that practice caused the weeds to grow. The result was quite the opposite. The stubble was burnt off every year, and wheat or oats sown for hay around the outside. That stubble was then ploughed in so that a good burn was possible. Even on land that was not cropped continuously he burnt the stubble, because the feed kept green for a longer period. The Chairman (Mr. J. B. Mitchell) desired to ascertain whether it paid better to allow the land to spell after a crop or to sow some sort of a catch crop, even if it were only grass seed. In England the small holdings were almost continuously cropped, a various assortment of fodders being grown after the grain was harvested. Mr. Serle said the seasons here would not permit of two crops being sown during the one year. He believed in drilling in oats for a catch crop between seasons. Mr. H. F. L. Holzgrete said he had not tried continuous cropping, principally because he had so much land that it was unnecessary. On old land two successive crops were the most he had grown. His practice was to grow rye grass after a grain crop. It kept the thistles down, and provided excellent feed for a few years. Land was becoming dearer, and farmers were working smaller holdings, so that grazing would barely pay on land worth £12 to £15 per acre. He had never grown oats, but believed they were a good crop to clean the land. In future he intended to try a continuous cropping on a small scale. The subject was an important one, and well worth discussing, as all land owners would have to get a good deal more out of their land in the future than they had in the past. He had seen successive crops of barley, oats, and Tuscan wheat grown on the Millicent Flats, and the third crop was one of the finest he had seen. That was only possible, of course, on good heavy land. If the land was not wanted for grain or hay, then it should be put under grass. Mr. Bell remarked that it was a good plan to sow rye grass with wheat. He put in a wheat crop, rolled it, sowed rye grass seed, and then fed the wheat off with sheep. The stock trampled the grass seed in, and later on he had a splendid crop of it. Mr. Holzgrete stated that if they wanted rye grass to last it must be fed off before it had time to go to seed.

#### MOUNT GAMBIER (Average annual rainfall, 32in.).

February 9th.—Present: 20 members.

POTATO-GROWING EXPERIMENTS.—Mr. R. Fowler gave the following results of the experiments conducted by Mr. Kilsby:—Brownell's Superior did very badly, the result being at the rate of 1 ton 16cwt. 94lbs. per acre. Early Rose—That was a new variety they tried this year. It grew quicker in the early stages than any other in the plots, and afterwards dried off very rapidly; but it turned out very fairly for the season. The result was 4 tons 4cwt. 24lbs. to the acre. Up-to-Date—That variety had not turned out too well, 2 tons 2cwt. 84lbs. per acre. The average for 1915 and 1916 was 3 tons 9cwt. 49lbs. Excelsior—This potato produced 3 tons 15cwt. per acre. The average for the two previous years was 3 tons 2cwt. 82lbs. Carmen No. 2—The yield this year was 2 tons 16cwt. per acre. They were also poor the year before (16cwt. 35lbs.), and the average for 1915 and 1916 was only 1 ton 9cwt. 76lbs. They were practically not worth digging in 1916. This was very disappointing, as the variety had been well spoken of wherever it had been grown. He did not know if it was the fault of the potato or whether it was the seed that was defective. The seed was very small. Bismark—The yield this year was 3 tons 6cwt. 83lbs. per acre. Last year, the second year of trial, the result was 3 tons 10cwt. 43lbs. Coronation Blue—These yielded 3 tons 17cwt. 41lbs. per acre. The average for the previous two seasons was 6 tons 4cwt. 22lbs. Thus Coronation Blue, on the average for the three seasons, had turned out a good potato. This year's crop was from their own seed; but he thought the imported seed would beat their own. Early Manistee—The yield of this variety this year was 1 ton 15cwt. 15lbs. per acre; a very small result. Its record for the previous two seasons was 3 tons 15cwt. 100lbs. Their own seed, from which they were grown this year, seemed to be very weak indeed. Scottish

Triumph—Yield this year, 2 tons 4cwt. per acre. Its record for 1915 and 1916 was 4 tons 16cwt. 9lbs. Pink-eye—These gave a return this year of 3 tons 10cwt. 90lbs. per acre. For the previous two seasons the average was 5 tons 10cwt. So he thought that when they took the average it would be found pretty well on top. Three rows out of the five were from their own seed, and they were as good, if not better, than the imported seed. British Vitality—The return this season was 3 tons 2cwt. 77lbs. per acre. They did not grow very robust, and produced very small tubers. Still, it was a Tasmanian variety, and might possibly require acclimatizing to some extent. Arran Chief—They had not dug the Arran Chief yet, but the haulms were spindly in comparison with the Snowflakes. They did not look as if they would yield very heavily. Beauty of Hebron and Sussex Red—These were also still to dig, as well as the Snowflakes put in to test the manures. The Sussex Red yielded in the first year 1 ton 18cwt. 41lbs., a very poor result, and in 1916 only 1 ton, although it was a better season, so they practically decided to throw it out altogether; but thinking it possible the poor return might be due to the seed, Mr. Spafford thought they might give it another trial. They planted new seed, and this year it was the surprise packet of the lot. It had grown well. He then referred to the spacing tests. He measured off a chain 12in. apart between the sets, another chain 16in. apart, the next 20in., and then 24in., 28in., and 32in., and then the ordinary space between them. The results last year were as follows:—12in. apart, 66 marketable tubers out of 98; 16in., 40 out of 70; 20in., 50 out of 76; 24in., 44 out of 70; 28in., 30 out of 50; 32in., 38 out of 58. The variety used was Scottish Triumph. Those results spoke in favor of the closer planting of potatoes. He should say that 12in. apart would be too close with the Snowflakes. He carried out the same tests this year, using Coronation Blue, but the results were not so marked. They were as follow:—12in., 72 large and 31 small tubers; 16in., 69 large, 22 small; 20in., 75 large, 27 small; 24in., 69 large, 21 small; 28in., 50 large, 23 small. They would find, looking at all the results, that the best varieties were Coronation Blue, Pink-eye, and Scottish Triumph. Bismarks came out fairly well, but the red varieties, with the exception of Early Rose, did not result very well. Mr. Fowler said he had come to the conclusion that deep planting was the best. It had proved so in America. By deep planting he meant not less than 5in. That seemed the most suitable depth to plant potatoes. Even at 5in. in a season like this there was not much moisture. The shallower the potatoes were planted the more subject were they to disease. In reply to a question regarding the dipping of seed, Mr. Fowler said they had not adopted the practice, as it involved a considerable amount of work, and he did not know that the results would be commensurate with the trouble. For blight dipping would be useless. It would be a good thing in the case of scabby potatoes, no doubt. Scab depended greatly on the soil, and resulted from mechanical injury arising from the soil in which the tubers were growing.

#### MOUNT GAMBIER (Average annual rainfall, 32in.).

SUPPLEMENTARY FEEDING OF FARM STOCK.—The following paper was contributed by Mr. F. B. Davidson:—“We all know that in the farming land about Mount Gambier there is an abundance of grass, in fact, too much for requirements during the spring, and much of it often becomes trampled down and otherwise destroyed. But about this time of the year, and during the winter months, our breeding ewes and dairy stock would do much better with a little extra feed. Much has been said about giving them oats and chaff. Both are very good, especially in a droughty year; but, fortunately, we do not get many such years here, and if we did more money could be made by selling our chaff and oats to other districts. I consider the better plan is to cut as much grass hay as could be spared, and to grow root crops and greenfeed. I know, of course, many farmers do cut grass hay, but I think they should go in for it to a much greater extent than they do at present. Only last Christmas I was struck by the appalling waste of grass. It was a good year, and there was a shortage of stock. Paddock after paddock of high grass could be seen simply perishing and becoming useless, whereas if it had been cut earlier it could have been made into excellent hay, and may come in very handy later on. Now, if a few small paddocks were fenced off, and crops of rape and mustard, Algerian oats, &c., or in the lighter soils rye or

sorghum, and later mangolds or sugar beet were grown, I think the stock would be helped considerably. Moreover, the small paddocks, which could be put under grass after every two or three years, would be much enriched by having had the stock on them in greater numbers, and manured by the droppings, for, without a doubt, sheep manure is the best fertilizer that can be got. I would also urge everyone to have a small plot of lucerne—a feed which needs no comment of mine. I would like members to try sugar beet, as I am convinced that it is one of the best stock feeds we could grow, apart from its value as a sugar producer, and I hope some day to see a factory for making beet sugar flourishing here. Last year I grew some as an experiment. I sowed it in drills in a paddock that had grown a crop of potatoes. The land had never been manured, but the result was very satisfactory. I and others from here sent samples to the Maffra sugar beet factory to be tested, and my sample beat all the others. It also compared with the beet tested in America, where, out of samples from 11 States, only two showed a better test in sugar, and none in purity; thus showing that it can be grown here, and grown to advantage. In this district sugar beet should be planted in August and September. I estimated that my crop would yield about 30 tons of roots, and from 15 tons to 20 tons of tops to the acre. This is just a rough estimate, but I think a crop that will yield anything approaching this is worthy of consideration. I strongly recommend having small paddocks on the farm, for then there are always some of them spelling, for, even if there is no crop growing on them, though the grass may not be better it will be fresher and the stock will thrive." Mr. J. H. Buck said much waste of grass occurred each year. Last year he tried an experiment by mowing down grass and grain crops for hay. He stacked half of it dry and half of it green. Both were satisfactory for feeding and from a financial standpoint. Mr. R. Smith agreed with Mr. Davidson on some points, but there was a lot to be considered. The present was a bad time for labor, and grass hay was a difficult thing to handle. It was nearly always spoiled by the rain. There was no doubt, however, but that it was the cheapest and best for fodder. Regarding the growing of sugar beet, one would not get such a big yield as of mangolds. A yield of 10 tons to the acre was considered a good crop, but the producer would probably get a 20-ton crop if mangolds were planted. He thought that better results could be obtained from maize if fodder was required and not a grain maize. Ninety-day maize he found a good variety. Mr. Buck thought the labor problem was not so serious as was made out. He would willingly pay a man 10s. a day if he thought it would save his cows, and believed any farmer would. The best mangold he grew was the Long White. Mr. F. Martin favored ensilage for feeding the cows. It was going to pay handsomely, and it was the only safeguard against food shortage. It was a good stand-by for autumn. If cows were put on to rape and taken off a couple of hours before milking, the milk would show no taint. He questioned whether lucerne would pay. The sub-soil was not suitable, being too porous. Peas and oats made a fine ensilage. He believed, in view of the high cost of material for silo construction, one could be made at a low cost by the use of saplings. The idea was to take six uprights, 1ft. in diameter and 15ft. high, and place 5ft. apart, with inside space hollowed out and intervening space filled with saplings laid horizontally on the ground, cracks to be filled with pug. He thought it would easily last for five years. Mr. H. G. Wheeler thought that our natural rainfall with our dewy nights was sufficient to grow lucerne. He had reaped two crops this year 3ft. high off the same patch. It was a good feeding crop, too. He was a great believer in maize, which carried the cows over the pinch of summer. The butter, too, produced from the milk of cows fed on maize was of superior quality. Mr. R. P. Pritchard favored maize, but thought sorghum was better. He had grown the Longfellow variety of maize. He planted it in three-ploughed ground, and drilled the seed in every third furrow. It came up straight and even, and was highly satisfactory. Mr. E. Tollner said he tried to make ensilage with grass, but it had been a failure. Then he had mixed same with oats, and it had been a success. Mr. Buck said he even used thistles with success. They made an excellent ensilage mixed with other fodder. Mr. H. M. Hogan said his experiences with maize had been different from the other speakers. Last year he had taken off a crop of 7 tons to the acre from a hand-sown field. This year, although his crop was drilled in, it was a failure.

## **AUSTRALIA'S SOLVENCY**

Depends on the Increased Production of

**FARMS, FACTORIES and MINES.**

**BUY**

**"SUNSHINE" FARM MACHINERY**

**HUGH VICTOR MCKAY'S FAMOUS  
FARM IMPLEMENTS and ENGINES**

are

**"ALL AUSTRALIAN"**

Made in Australia by Australians, to suit Australian conditions, from iron ore mined at Iron Knob, South Australia, treated at Newcastle, N.S.W., and manufactured at Sunshine, Victoria.

The "Sunshine" industry employs directly and indirectly thousands of Australians who help pay Australian taxes.

### **Keep Your Money in Australia.**

The bugbear of the farmer is taxation.—If money is kept in Australia there will be less taxation. "Sunshine" can supply the bulk of your requirements in Farm Machinery, and "Sunshine" products merit your support.

**Write for Catalogues. — — — Call and Inspect.**

**H. V. MCKAY,** "Sunshine" Showrooms,  
56, North Terrace, Adelaide.

**WALLAROO-****MOUNT LYELL****SUPER!***It pays you best***Forgan's Shares  
Will Fit Your Plow.**

Forgan's Shares are manufactured to fit every make of Plow and Cultivator. That is one reason why there are more

**FORGAN'S CAST CHILLED  
PLOW AND CULTIVATOR SHARES**

used in Australia than any other make. Other reasons are:—They wear longest, and will take the ground until worn right back to the socket; they are specially chilled to suit all classes of land, and they are **CHEAPER** than other makes.

**PUT THEM TO THE TEST.****J. & R. FORGAN,** Crystal Brook and Pt. Pirie.

## POULTRY BREEDERS.

---

On application (personal or by letter) to the Poultry Expert, Adelaide, Advice on Feeding, Breeding, Housing, and Diseases, &c., will be given.

Arrangements made for Lectures in Country Districts, and Visits of Inspection paid to Poultry Yards and Farms.

**Publications.**—On application Breeders' names will be placed on the Mailing List.

Monthly Notes in *The Journal of Agriculture*; subscription 1s. per annum, posted; 2s. 6d. Inter-State.

---

### GOVERNMENT POULTRY STATION—PARAFIELD.

Inspection is invited of Stock and Methods Adopted.

---

**PUBLIC VISITING DAYS**—1st Wednesday and 4th Saturday in each Month.

---

### EGGS AND POULTRY FOR LOCAL MARKET AND FOR EXPORT.

Instruction as to Age, Weight, and Methods of Fattening Poultry for the English and Local Markets.

**EGGS.**—Further particulars on application.

Please address all correspondence—

**THE POULTRY EXPERT,**

**ADELAIDE.**

TELEPHONES { 6464  
                  { 6465.

# CROWN LANDS.

## AUCTION SALE OF TOWN LAND.

To be held at the Land Office, Adelaide, on Thursday, May 9th, 1918, at 11 a.m.  
 Allotments in towns of Bruce, Cannawie, Cungiua, Iron Knob, Kimba, Koolywurrie, Kyancutta, Lock, Marama, Mercunda, Meribah, Minnipa, Mount Hope, Talia, Warramboo, Wirrula, Wudinna, Yaninee, Yantanabie, and Yatina.

Also

Sale of leases of forest land in hundreds of Howe and Darling.

Full particulars are published in the *Government Gazette*, or may be obtained, with plans, on application to the Secretary for Lands, Adelaide.

## APPLICATIONS FOR LAND.

Intending applicants for any lands which are open are reminded that application may be made for the whole or any portion of a block. The Land Board has power to allot portion of a block, if considered advisable, and to adjust the purchase-money or rent. If only portion of a block is applied for, deposit of a proportionate amount must be made, and the successful applicant would be required to pay cost of survey.

## ALLOTMENTS, SALES, TRANSFERS, SUBLEASES, AND MORTGAGES.

Notice is hereby given that in future no applications for land, or for transfer, sublease, or mortgage of Crown leases or agreements will be approved to unnaturalised persons of any nationality, or to naturalised persons of enemy origin unless the consent of the Honorable the Attorney-General of the Commonwealth be first obtained by the parties making the application.

Where any doubt as to nationality exists, it will be necessary for certificate of birth or naturalisation papers to be exhibited.

The same principle will apply to land sold by auction.

## OFFICIAL LIST OF LANDS OPEN.

The attention of intending applicants for land is directed to the Official List of Lands Open which may be seen at the principal Post Offices, and copies obtained at the Office of the Secretary for Lands. The List shows the Areas, Localities, Prices, &c., of the Sections available and the conditions under which they may be applied for.

## NOTICE TO APPLICANTS FOR LAND.

The Land Board meets daily (when necessary) at the Board's Office, Department of Lands, to deal with applications received the previous day for any lands that may be open in the Official List. Applicants must either attend personally or send a full written statement. Forms can be obtained at Post Offices, or on application to the Secretary for Lands.

HARRY JACKSON,

*Commissioner of Crown Lands and Immigration.*

# AGRICULTURAL COLLEGE, ROSEWORTHY.

The seed grains submitted for sale this season comprise a number of early, mid-season, and late wheats and barleys, a mid-season variety of oats, and a small quantity of field pease. The cereals have all been selected from pure strains and well graded. The production of selected and graded seed has been continued at the College for over 12 years, and hence most of the strains now being offered possess unbroken pedigrees of considerable length.

## CATALOGUE AND PRICE LIST OF SEED GRAINS AVAILABLE FOR 1918 SEEDING.

Orders will now be booked for any of the undermentioned varieties, and applications will be dealt with as far as possible in the order in which they are received. The prices quoted are "on truck, Roseworthy," and are subject to revision. All orders and inquiries should be addressed to—

THE PRINCIPAL,  
Agricultural College, Roseworthy.

### GRADED PEDIGREED SEED WHEATS.

#### EARLY VARIETIES.

|                           |             |    |     |            |
|---------------------------|-------------|----|-----|------------|
| King's White . . . . .    | Selection 9 | .. | 5/- | per bushel |
| King's White . . . . .    | " 10        | .. | 5/6 | " "        |
| King's Red . . . . .      | " 10        | .. | 5/6 | " "        |
| Caliph . . . . .          | " 1         | .. | 5/- | " "        |
| College Eclipse . . . . . | " 9         | .. | 5/- | " "        |

#### LATE VARIETY.

|                       |             |    |     |            |
|-----------------------|-------------|----|-----|------------|
| Le Huguenot . . . . . | Selection 6 | .. | 5/6 | per bushel |
|-----------------------|-------------|----|-----|------------|

### GRADED AND PEDIGREED SEED BARLEYS.

#### EARLY VARIETIES.

|                   |             |    |     |            |
|-------------------|-------------|----|-----|------------|
| Tunis 1 . . . . . | Selection 1 | .. | 4/6 | per bushel |
| Tunis 2 . . . . . | " 1         | .. | 4/6 | " "        |
| Tunis 3 . . . . . | " 1         | .. | 4/6 | " "        |

#### MID-SEASON VARIETIES.

|                                |             |    |     |            |
|--------------------------------|-------------|----|-----|------------|
| Tunis 4 . . . . .              | Selection 1 | .. | 4/6 | per bushel |
| Tunis 5 . . . . .              | " 1         | .. | 4/6 | " "        |
| Roseworthy Oregon . . . . .    | " 9         | .. | 4/6 | " "        |
| Roseworthy Shorthead . . . . . | " 10        | .. | 4/6 | " "        |

#### LATE VARIETY.

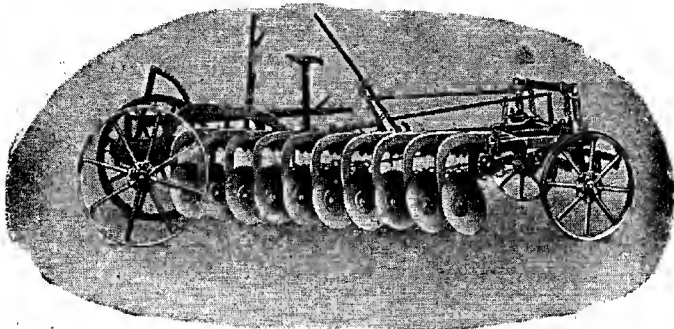
|                   |             |    |     |            |
|-------------------|-------------|----|-----|------------|
| Tunis 6 . . . . . | Selection 1 | .. | 4/6 | per bushel |
|-------------------|-------------|----|-----|------------|



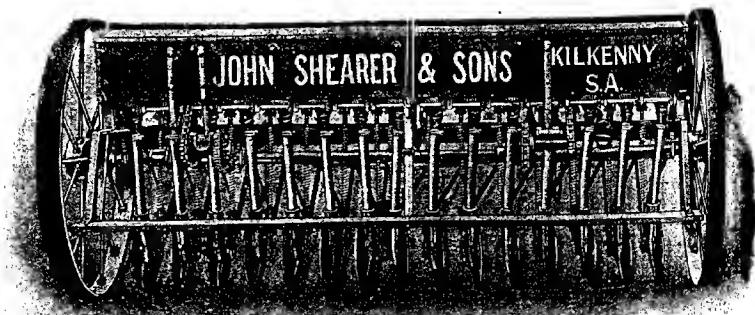
# SHEARER'S PATENT STUMP-JUMP IMPLEMENTS

## PARRAKIE DISC FIELD TRIAL

Eight competing. Result—SHEARER'S FIRST.



**Patented 10 one-way Disc Cultivating Plough, with Bridle Draught**  
Made in sizes from 4 to 12 Discs, with Bridle Draughts.



**Shearer's Patent Seed and Fertilizer Drill.**  
Hundreds of Unsolicited Testimonials.

Write for Catalogue and Price Lists.  
Full Stock of 'Shearer' Steel Plough Shares always on hand.  
Prompt dispatch can be given.

ADDRESS:  
**John Shearer & Sons, Kilkenny, S.A.**

## Roseworthy Agricultural College.

WALTER J. COLEBATCH, B.Sc. (Agric.), M.R.C.V.S.,  
Principal.

### SUBJECTS:

Agriculture, Veterinary Science, Dairying, Aviculture.  
Viticulture, Wine-making, and Fruit Culture.  
Chemistry, Mathematics, Botany, English, Book-keeping.  
Surveying and Wool-classing.  
Manual Practice on Farm, Vineyard, Orchard, and in Dairy  
Wine Cellars, and Farm Workshop.

### FEES:

£30 per annum (including board and lodging) and £1 for  
medical fees, payable *pro rata* at the beginning of each  
session.

### SCHOLARSHIPS:

Six, each valued at £90, open for competition annually.

### SESSIONS:

The course of study extends over nine sessions, or three years.

The FIRST SESSION of each year begins on or about the third  
Wednesday in April and closes on or about the third  
Friday in July.

The SECOND SESSION opens on or about the second Tuesday  
after the close of the first session and closes on or about  
the second Friday in October.

The THIRD SESSION opens on or about the second Tuesday after  
the close of the second session, and closes at the comple-  
tion of the vintage.

---

*Applications for Prospectus and information should be addressed to—*

THE SECRETARY,

AGRICULTURAL COLLEGE,

ROSEWORTHY.

# THE GREAT HOUSE FURNISHING EMPORIUM



## The AUSTRALASIAN IMPLEMENT and HOUSE FURNISHING CO.

NORTH TERRACE, ADELAIDE.

*R.H. WHITE, Manager.*  
(G.P. HARRIS, SCARFE & CO. LTD. PROPRIETORS)

COMPLETE HOUSE FURNISHERS  
SPECIALISTS IN DECORATIVE EFFECTS.

WE HAVE INSTALLED THE MOST COMPREHENSIVE SYSTEM OF MODERN FURNISHED ROOMS EVER INTRODUCED IN THE COMMONWEALTH. EACH ROOM BEING A STUDY IN CORRECTNESS AND ECONOMICAL FURNISHING. INSPECTION INVITED.

KINDLY  
INSPECT  
OUR

30

MODERN  
FURNISHED  
ROOMS

SPECIAL

Rich in beautiful well seasoned woods  
and Australian Craftsmanship.

Unique in Original Designs and  
Superior Upholstery Work.

Original Decorative Suggestions in  
Spanish Leather & Tiffany Mottles.

Exclusive Fabrics for Curtains  
Loose Covers and Portieres

Fine Carpets and Rugs from England  
and India, rare designs and colorings

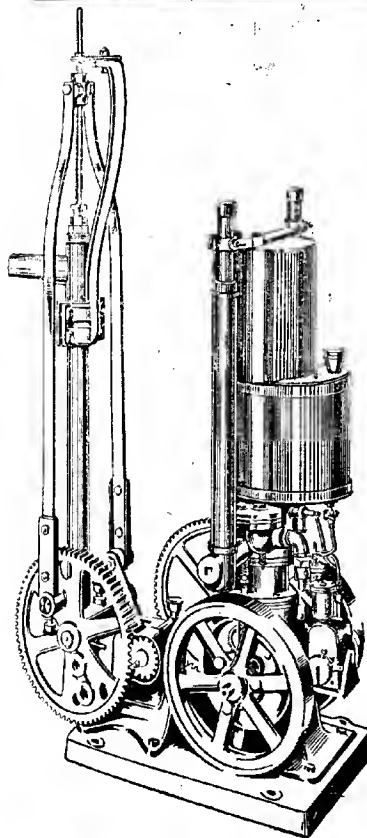
The skill of the Worlds Pottery Artists  
is embodied in our choice selection on view.

Furnished Rooms for Repatriated  
Soldiers, a study in Sound Value.

A Visitor States: "There is nothing in the Eastern  
States that will compare with these Modern  
Furnished Rooms."

CONSULT US FOR ALL MODERN FURNISHINGS.

# COOPER Little Giant



## The Cooper "LITTLE GIANT" Pumping Outfit.

Strong and thoroughly practical.

Consists of a strong high-grade 2 H.P. Engine and substantial all-metal Pump Jack with high-grade cut gears.

It is very compact, and is designed to give long years of service, to run with very little attention, and to operate at a very small cost of upkeep.

The engine can be instantly detached and used for other work, such as driving chaffcutter, wood-saw, winnower, &c.

The "Little Giant" Pumping Outfit will lift water from wells or bores up to 200 ft. deep. It has attained a record throughout Australia never before equalled.

Write for Further Information

SOLE AGENTS—

**The Australasian Implement & House Furnishing Co.**

(R. H. White, Manager)

(G. P. Harris, Scarfe & Co., Ltd., Proprietors)

**ADELAIDE**

# TOP BRAND



**SUPER** VALUE.

Manufacturers,  
**THE ADELAIDE CHEMICAL & FERTILIZER CO., LTD.,**  
Currie Street, Adelaide.

---

**OVER 5,000 FARMERS**

**are members of the**

**Agricultural Bureau,**

**ARE YOU?**

If not, join a Branch\* at once. If the nearest Branch is not within reasonable distance of your Home, write to the Department of Agriculture for particulars as to how to form a Branch.

**It is to your interest to do so.**

